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Patron of the Society.

President of the Society, 1892—1910.

The Journal

OF THE

Manchester Geographical Society.

* * *

TRADE ROUTES.

PAST AND PRESENT—EAST AND WEST.

By Richard Kalisch, F.R.G.S.

(Addressed to the Society in the Geographical Hall on Tuesday, March 22nd, 1910.)

I am obliged to start with a confession and an apology. I find I have undertaken more than I can achieve in the time at my disposal to-night. My title had to be handed in months before I had an opportunity of preparing this paper, and a short time ago, when I started to think out my subject, I found that it offered material for a dozen lectures, not one, and my only excuse for cutting down and therefore not doing justice to the title is to be found in my not wishing to change it at the last moment. I am therefore not able to deal with the various sections in as thorough a manner as I should like.

I have travelled about the world for many years in the interests of business, and have made a point of studying in my periods of leisure as much of the countries visited as possible. Obviously my knowledge is very limited. I took photographs from the beginning and after each return home utilized a representative set of my negatives for making lantern slides. It has been a somewhat difficult task preparing this evening's selection, for it has entailed a ruthless cutting down of material. I propose to touch upon a few routes somewhat off the beaten track and possibly therefore of greater interest to you than were I to confine my remarks to the more important and well-known ones. In the East I shall deal with several Chinese, one Siamese and one Burmese route, in the West with various Central and South American ones, a few of the many I have been fortunate in traversing.

EAST.

CHINA.

To endeavour to trace the origin of any great Chinese trade route must needs bring one to the very source of the Chinese themselves. We know of course that speaking broadly the Chinese form the one exception to the rule of great empires developing westwards. For the Chinese are taken to be the direct descendants of clans originating in Mesopotamia which we are taught to consider as the cradle of the civilization of this world. This means that they moved eastwards. I do not propose to go into any details of China's earliest days beyond mentioning that China is supposed to owe its name to one of its first dynasties—the Tsins. And it was Che-Hoang-Ti, the greatest of this line and China's first Emperor who in 214 B.C. began that stupendous national work—the Great Wall. It was so constructed as to close practically every valley running into the greater portion of China from the North and North-West. Of necessity therefore it furnished the entrance and exit of every trade route to and from China in these directions.

This brings me to the first of the routes I propose to discuss, a section of the Peking—Kalgan—Urga—Kiakhta route, running through the Nankow Pass, the Gobi desert and the heart of Mongolia. The mileage of the entire route is not far off 1,000 miles. Tea is the great staple of this trade route, and enormous quantities are transported. The bulk of this particular tea thus conveyed is made up in compressed bricks, and as a matter of interest—lumps of this brick-tea serve as a medium of exchange in parts of Mongolia. Besides tea, salt, rice, furs, silks, earthenware, cotton, beans and many more articles are regularly transported. The duties of transport have been borne through the centuries, and are still, by camels, but the day is not far off when a railway will take their place, and then presumably Mongolia will be face to face with one of our great economical troubles—unemployment—for it is said that several hundred thousand of these animals will lose their "job" in consequence. The railway track is steadily advancing, and in 1907 was in working order as far as Nankow, situated at the mouth of the Pass. Along the Pass we saw evidence of its advance and I understand that passenger traffic

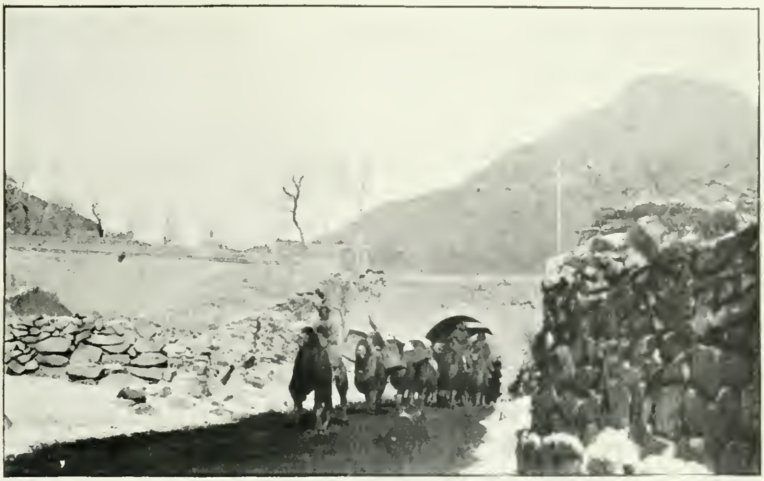

Fig. 1. China. View in the Nankow Pass.

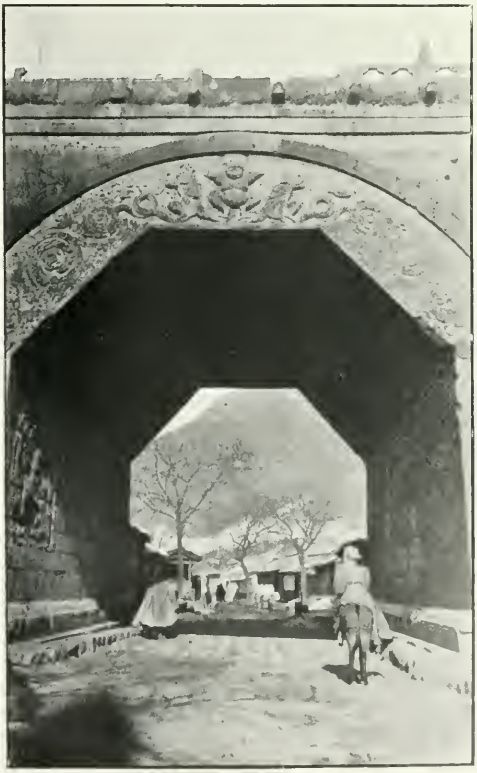

Fig. 2. China, Ancient Gateway, described by Marco Polo.

has already begun, so that in a few more years the curious, old-world effects and sights which delight the traveller's eye will be things of the past. This railroad is being built exclusively by the Chinese without European help, and very proud they are of their work, and I understand they have every reason to be so.

In order to enable you to become acquainted with the main features of this famous Pass, we might accompany one of the numerous camel trains from the starting point of their long return journey to their northern homes. They usually travel by night, but the exceptions are frequent. As one passes out of Peking skirting the walls and entrance to the Forbidden City, one meets frequent caravans arriving laden with the produce of the North. Many of them have come distances of 700 to 800 miles which have taken months to perform. One's last view of Peking is very striking, for its huge Tartar Wall which encloses the Tartar City forcibly removes one's thoughts to the past when what one sees was being constructed. Should you perchance have the good fortune to view these surroundings on a winter evening as the sun is setting, you will have enjoyed a spectacle, the memory of which may haunt you for a long time. A vast expanse of snow-covered plain surrounds you; in the distance outlined against a superb wintry sunset stand Peking's ramparts crowned at intervals by immense watch towers and gateways. As you turn towards the setting sun, which throws a strange purple hue over the wastes of snow, a faint tinkling reaches your ear, and gradually a caravan of the ships of the desert heaves into sight and passes on its way like a spectre.

The distance from Peking to the Nankow Valley is about 25 miles, and the route calls for no special comment. The Pass runs out of this Valley in a westerly direction. In parts it is quite narrow; it broadens out, however, considerably in places, and occasionally one comes across incongruous sights such as an ancient crude rampart, facing a modern bridge on the new railroad. The latter utilizes but short stretches of the actual old trade route. The vegetation along the Pass offers no striking features. The nature of the road varies according to local conditions. In some places it is cut through the rocks, and in others it is almost equal to our own country roads,—but a glance to either side will show that such has not always been the case—the traffic of a score of centuries has known how to triumph over the innumerable obstacles such a mountainous district can offer. (See Fig. 1.)

Besides camels led or ridden by their interesting Mongolian owners clothed in skins and furs, one meets with all sorts of mule and Mongolian pony traction. The carts in these parts are extremely heavy and very strong, and have a curious accessory in the form of a spare animal which is fastened but loosely to the vehicle. When they ascend, it is whipped to the front and aids in pulling; when the cart has to descend a steep hill, it is sent behind where it acts as a brake. That is to say, it resists the forward movement of the cart to the utmost extent of its power. It plants its four feet squarely down and pulls backwards. Round its neck it has a strong collar which it attached to the cart and which gives it the necessary leverage. You often witness very cruel sights in connection with this custom. The Pass is sparsely populated, the inhabitants crowd together in hamlets which resemble each other in one respect particularly, namely that those which are ancient are invariably protected by strong walls. These fortifications climb every hill and close every opening into the villages. They have double entrances, so that even if the enemy broke through the outer defence, they found themselves in a sort of bear-pit with high walls on all sides, from which there could be no escape, for before they had time to storm the other gateway, the defenders were able to drop rocks and boiling oil on them, or to pierce them with arrows from above. Some of the gateways call for comment. One in particular is a remarkably fine example of ancient Chinese art. (See Fig. 2.) The stone is carved throughout. Marco Polo in his wanderings in China during the second half of the 13th century, say about 1280, travelled through this Pass and remarked upon the great beauty and interest of this ancient gate and reported upon it to his great master, the Tartar Emperor Kublai Khan. The age of the gate I have not been able to ascertain, but it would appear to be extremely ancient, and was possibly constructed before the Christian era.

Temples erected for the use of travellers exist at intervals, and have great stone arch approaches.

As the end of the Pass is approached, an inner section of the Great Wall of China comes into sight. You will gain a rough idea of the magnitude of this work when you bear in mind that it is about 2,000 miles in length, reaching from Shan-Hai-

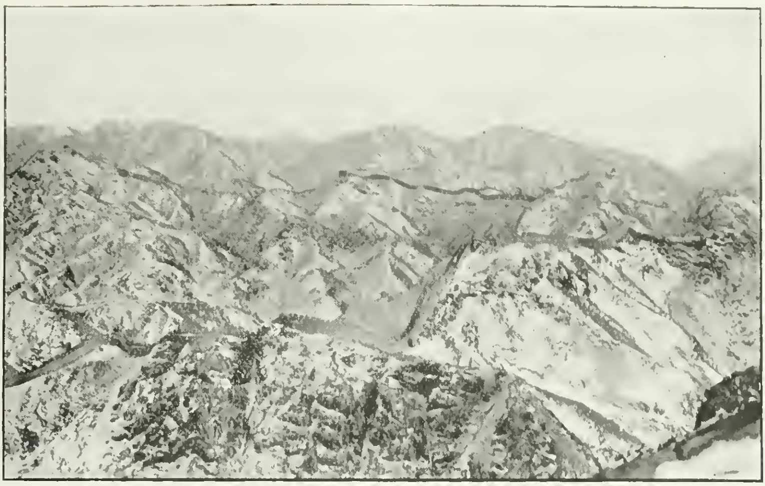

Fig. 3. China. Part of the Great Wall.

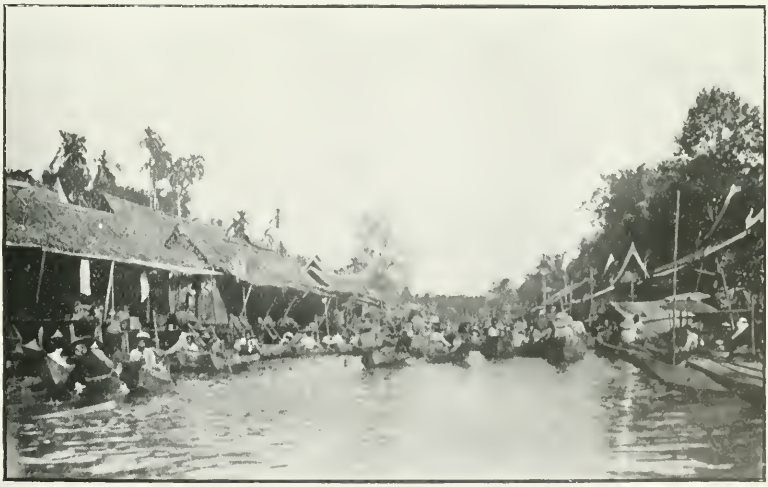

Fig. 4. Siam, Market Day, near Bangkok.

Kwan in Northern Pechili, where it runs into the sea, to far into Central Asia. It is built of solid granite, of rocks, bricks, sand and common earth. In parts it is still in excellent condition; in others but a mere sand heap indicates its former presence. It is easy to follow the course of this wonderful wall, for it rises and falls with the undulations of the ground. It closes every valley running into the country, and crowns every height. In places it is so steep that it is difficult to climb up. Watch towers are situated at distances of about 100 yards in the mountainous districts. (See Fig. 3.)

Once outside the Great Wall, the route leads on into Mongolia through the great plains and gradually into the Gobi desert which one is obliged to cross in order to reach Siberia and Russia.

The second route in China which I am going to touch upon can hardly as yet be termed a trade route; it is essentially a new road and has barely started its career. But it is destined to become one of the very greatest and most important highways of the world. I refer to the route from Peking to Hankow. A railroad with a most interesting and involved political and financial history connects the two places. Its length is about 700 miles. It has no past. It is the modern connecting link between that great industrial centre Hankow—a great part of the heart of China proper and the capital and large cities of the north. The Grand Canal was formerly the only means of inland communication between North and South China. It was constructed in the 13th century, is 600 to 700 miles long and was a great piece of work, but it has been badly neglected and is fast decaying in many parts. It runs comparatively close to the coast connecting Hangchow with Tientsin.

Hankow has probably the greatest future of any city in China. It is most advantageously situated on the Yangtze, and the biggest cargo steamers can reach it. It is, as stated, the terminus of the Peking railroad, and will be at one end of the great Canton railroad now being slowly constructed, 600 miles in length. But apart from railroads, it is situated in a commanding position with regard to traffic by water in practically all directions, thanks to the Yangtze, and its important tributaries. It is a great producing centre, both as regards manufacture and produce. Of all the numerous industrial features comprising cotton, silk and ramie mills, tea and rice factories (not to mention a host of others of minor yet considerable importance), by far the most interesting are the Iron Works and Arsenal at Hanyang, a large city adjoining Hankow, much as Salford runs into Manchester. One may justly term this undertaking the Woolwich of China. It has a vast future, quite as much from the commercial as from the national point of view.

In proceeding through the centre of China to Hankow,—the country one travels through is mostly uninteresting, one of the exceptions being the Hoang Ho, the great treacherous Yellow River which has destroyed more life in China than any other single factor, owing to its various changes of bed. Round about 32° N. the scenery has considerable charm, thanks to a range of mountains the railway crosses. On some of the heights are still to be seen the ruins of ancient strongholds. Pechili, Honan and Hupe, the three provinces traversed, produce prodigious crops of millet, tea and rice, not to mention wheat, barley and numberless other desirable and undesirable items. These three provinces have an approximate population of almost 100 millions, which is probably one quarter of the total population of China.

In order to regain the coast we must descend the Yangtze Kiang which has for many years played an important commercial part, but which has a far greater future before it. This river is over 3,000 miles in length and many miles broad in parts. Steamships have navigated it 1,500 miles up its course and native craft go as far as 2,000 miles. Ocean going vessels of all descriptions have regular sailings to Hankow 600 miles up the river; beyond this the service is more or less irregular. The nature of the country through which the Yangtze flows from Hankow to the sea is in great contrast to the higher reaches of the river—uninteresting from the spectacular point of view, for it is very flat, but wonderfully fertile from the agricultural standpoint. Vast tracts of country on both banks are regularly flooded during many months of the year owing to their level being below that of the river. Half submerged villages are the rule and not the exception. Withal, the Provinces containing this portion of the wonderful Yangtze basin produce huge quantities of cereals, and count close upon 70 millions as their population. Shanghai, situated on the Whangpoo which runs into the estuary of the Yangtze, is too well-known to all of you to require descriptive adjectives of any kind.

It would be hardly correct to take our leave of China without referring to Macao, which, in the 16th century was the furthest goal of all far-eastern trade routes. Macao was the first place in China where Europeans lived and traded. It was here that the Portuguese in 1557 discovered a new and wonderful market to open up, and they prepared the way for all Europe. Nowadays it is a sleepy little hole devoid of importance of any description. For centuries it was a factor to be reckoned with, both commercially and diplomatically. Hong Kong has since taken its place and attained extraordinary development, its position with respect to Canton, the first Chinese port opened to European trade being, no doubt, to a large extent responsible for this.

Siam.

The next route to be discussed in the East is the Menam river, the principal thoroughfare of Siam. Although of distinctly minor importance it is in some respects quite an interesting little vein as regards a considerable export of rice, timber, tin, etc., and also of interest with an eye to the future when it may offer great prospects in case of the eventual partition of the Kingdom. In order to keep strictly to my subject, I am obliged to deal solely with the watery aspect of the country, for practically the whole of Siam's export and import traffic is by water, up and down the rivers and klongs; the latter are canals which connect and link up the different parts of the country. Although the towns and country are full of interesting features, it is perhaps just as well that the aforesaid is the case, for it spares you the disgusting sights and smells which are one of the great drawbacks of terra firma in this kingdom. There are a few railroads in existence and more are being built, but they are not very progressive, and the country does not as yet benefit much by them.

The length of the Menam is estimated at approximately 750 miles, and the valley through which it flows is the richest part of the country. The mouth of the Menam is bad, owing to numerous sand banks. There is but one extremely narrow channel open to and from the sea. The government does not even try to remedy this, although shipping interests would derive great benefit. It looks upon these barriers as a natural defence against any power which might wish to send war vessels up the river to attack the capital. Thanks to this, only light draft vessels can go as far as Bangkok, cargoes having to be transferred to tugs and lighters for conveyance up or down the river. The life on the rivers and klongs is both amusing and instructive. The past rubs shoulders with the present all the time, and the old fashioned canoes and rafts of the natives compare quite favourably with the boats, steamers and electrical launches of the European community, not only as regards comfort, but also as to cargo carrying capacity. An interesting feature is the river steamer towing scores and scores of empty rice boats up country after they have deposited their shipments in the rice go-downs of Bangkok. These native boats are so light in weight without their cargo that they cannot go far against the stream. As they are hundreds of miles distant from their homes a regular system of tug steamers exists.

A rural Siamese market day is a sight worth recording. The canoes take the place of carts and booths, and it is remarkable to observe the order and despatch of the proceedings, the manner the barques are handled and the diversity of bargains struck. (See Fig. 4.) With the exception of the main street and a few side ones, the shops, stores and houses face and open out on to the water. Of all striking features, however, it must be the luxurious tropical vegetation of the land, as one sees it from the waterways which lingers longest in one's memory.

The palms, creepers, giant ferns and bush, whether in compact jungles or surrounding and framing villages, monasteries and temples, are equally superb.

BURMA.

The last trade route in the East I propose to dwell upon is the river Irawadi. Burma is one of those countries which is bound to saturate the visitor or resident with souvenirs of the most pleasant kind, and although business took me there and occupied most of my time, it is not to business interests that my thoughts fly whenever I come across the word Burma. Those who have any knowledge of that country can never quite forget the great charm and fascination of its inhabitants and their customs, of its vegetation and of its places of worship.

The Irawadi counts among the great rivers of the world

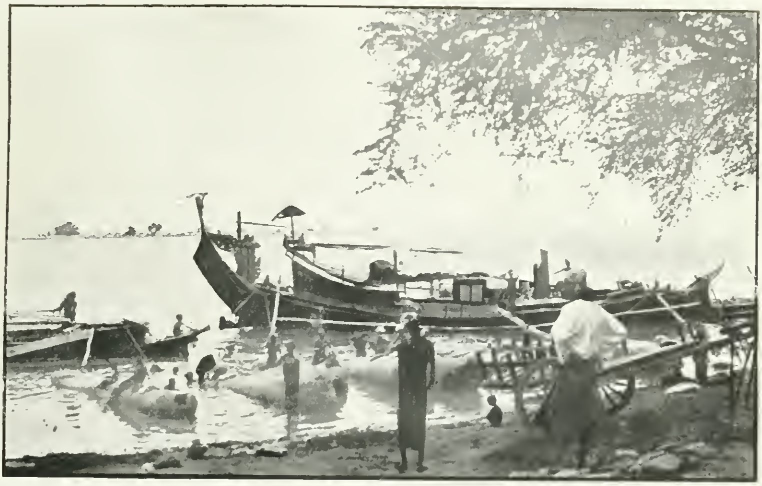

Fig. 5. Burma, on the Irawadi.

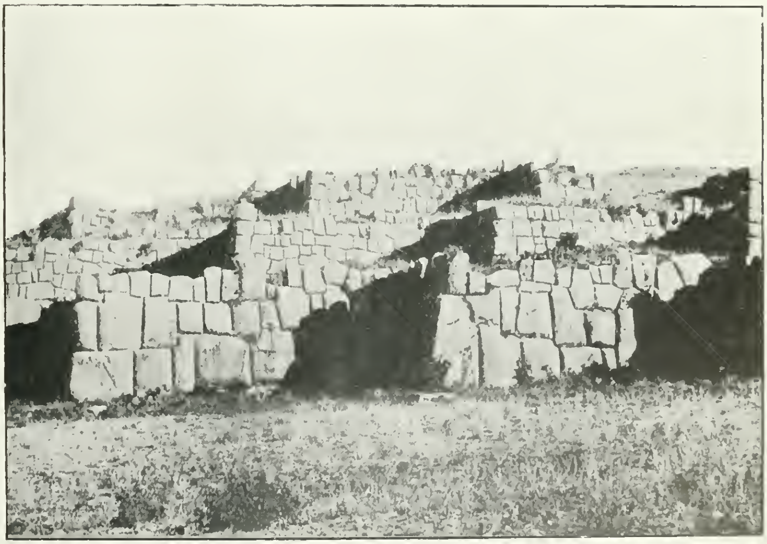

Fig. 6. Peru. Ruins of the Inca Fortress of Sacsaihuaman.

from almost every point of view. It has a length of over 1,200 miles and a breadth of a couple of miles in parts. It is navigable by river steamers up to Bhamo, nearly 1,000 miles from the coast. This river must have witnessed strange sights in the past, for to this day its banks bear ample traces of several powerful native kingdoms whose one great aim seems to have been to conquer their neighbours. Much blood has been shed in and near its waters, even to our present time, when in 1885 the last Burmese war brought the whole of Burma under British rule. Then, too, the Irawadi served as base and line of communication for the British army.

The Irawadi is the great artery of Burma. Along its course to east and west lie the best and richest parts of the country. There are a few railroads which have opened up great stretches of land, but the Irawadi still quite holds her own in the matter of transport. Burma's great resources are rice and timber, particularly teak, which gives her elephant population employment, further, cotton, minerals, petroleum, precious stones and tobacco, the greatest part of which come to the coast by water. The vast bulk of the imports find their way up country by the same route. The types of vessels navigating this river are well worth study. The steamers of the Irawadi Flotilla Co. are extremely conveniently built both for passenger and merchandise service; travellers enjoying every comfort and attention, whilst very large cargoes are carried notwithstanding their comparative small tonnage. The numerous kinds of native sailing boats, combine with great picturesqueness, considerable carrying capacity. Some of the latter appear like huge snow-white birds flitting over the water; others are remarkable for the peculiar high build of their sterns, which are adorned with gilded peacocks—the emblem of Burma—or finely carved armchairs. The traffic on the Irawadi is subjected to a forced rest from sundown to sunrise: both European and native craft tie up to the river bank. (See Fig. 5.)

At almost every river port one has evidence of the varied nature of the country's products and productions, one of the commercial features held in common being fortunately an active piece goods bazaar. The river banks offer material for study to almost every section of the public. If you are interested in the study of Buddhism—countless fine pagodas, shrines and monasteries, with their picturesque attendants, the yellow-robed priests—will serve to increase your appetite. Should your taste turn to Burmese history, the sites and ruins of the capitals of several ancient kingdoms will satisfy it. If you are a business man, such enterprises as the exploitation of the great oil deposits will interest you, not to mention a host of other matters. The sportsman would gain new ideas from the cocoanut milkers, and the grumbler become cheerful at not inhabiting a district where the rainfall is 150 to 200 inches per annum, as is the case in the Irawadi delta, and at not having the durien as a neighbour.

As you approach Rangoon, you cannot help but see the most wonderful landmark of the country—the centre piece of the greatest Buddhist shrine in the world—the Shwe Dagon. You see it facing you on the terrace of the Pagoda, a huge, finely proportioned gilded altar bell with a diamond and emerald studded umbrella at the top. As you stand at its base and watch the throb of Burmese life and the emblems of Buddhist faith around you—your sympathies are stirred and your heart goes out to this charming *dolce far niente* people. To add to the impression you become suddenly aware of a delightful tinkling far, far above you: it comes from the little gold and silver bells nearly 400 feet high attached to the tee at the top of the monument.

WEST.

In the West I shall touch upon three routes, one Central American and two South American; one of them but a relic of a glorious past, now to all intents and purposes non-existent, and its present-day substitutes. The other two are destined some day to count among the world's greatest thoroughfares. I will deal with them according to seniority, which brings me in the first place to the old Inca route running through the heart of Peru and connecting the Inca capital—Cuzco—with Quito and the most distant cities of the Inca empire. Then I shall discuss the Isthmus of Panama with the canal zone, and finally the Transandine route from Chile to the Argentine across the southern cordillera.

Peru.

Peru perhaps more than any other country I have a knowledge of, is dependent for her future prosperity as a

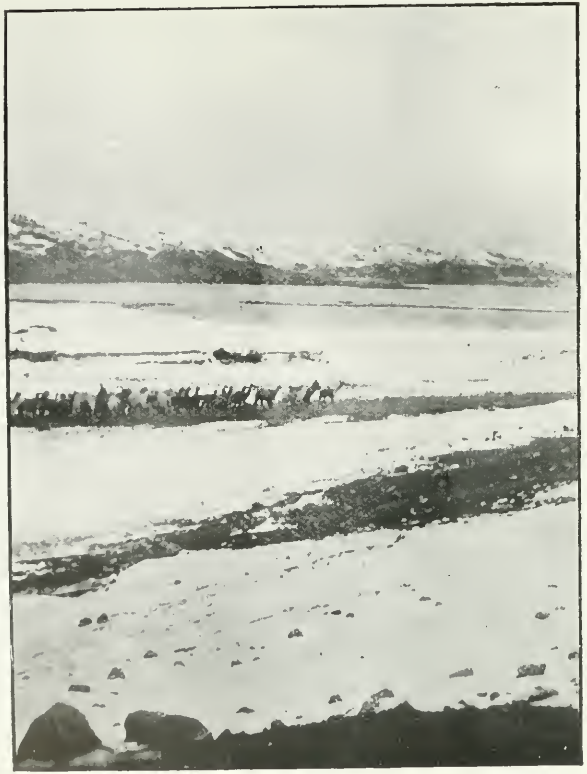

Fig. 7. Peru, Llama train in the Andes.

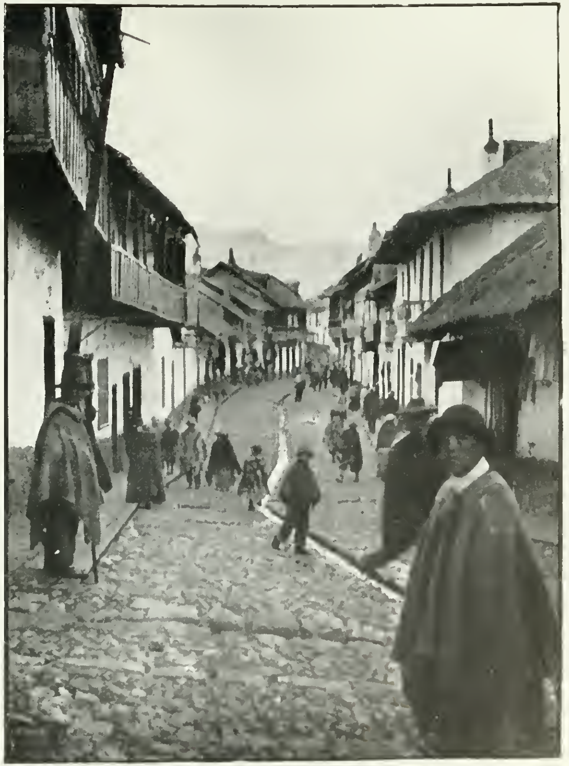

Fig. 8. Peru, Main Street, Cerro-de-Pasco.

nation—on the means of communication with her up-country provinces. For the following reasons. Peru was and is a country very amply provided by nature with unbounded wealth, but last century witnessed two of her great resources, in the one case torn from her by a national disaster and in the other gradually depleted by commerce. I refer to nitrate and guano. The nitrate deposits were taken away in 1883 after her disastrous war with Chile—and her guano deposits are gradually being used up. Both of these sources were of facile access and easily worked, being respectively directly on the coast and in its immediate neighbourhood. Very differently situated are a great part of the balance of her natural riches—minerals and agriculture of all kinds. With regard to the latter, I refer of course to the splendidly fertile transandean valleys, not to the coast regions from where her other stores of wealth are derived, such as petroleum, coal, sugar, rice and cotton. In order to get at her great mineral and part of her agricultural resources, it was imperative to make roads from the coast across the ranges of the Andes. The cost of labour and material in the making of such routes is obviously enormous and sometimes quite out of proportion to the immediate results obtainable. I may here draw your attention to an interesting feature which is not noticeable in many other countries. Our English routes and the routes of most other countries cover the same tracks which existed in another form centuries ago. This in no way applies to Peru. The very contrary is the case. The old Inca roads no longer exist, nor have they practical successors of any kind. In the old days, say up to the beginning of the 16th century, the Inca empire was a self-contained, self-sufficing nation in every respect—the only use they had for the sea was for fishing purposes; they therefore but needed highways to the various parts of the empire. There were two such main routes, and one or two minor ones, both about 1,500—2,000 miles in length, the one led over the tops of the mountains (literally speaking) and over the high plateaux of the Andes; the other along the plains and across the spurs of the sierras near the coast—from south to north. Peru's present-day requirements run from east to west and *vice-versa*—therefore at right angles to her former means of communication. This is of course due to the fact that the country is nowadays greatly dependent on her exports and imports to and from foreign countries, and her roads are bound to offer the necessary facilities. Hence her pressing wants were roads from the coast over the foothills and across the various cordillera ridges. The connecting link between the Inca Empire, which practically ceased to exist in 1533, and Peru of our day is, of course, furnished by the period of Spanish rule—a matter of nearly 300 years. The Spaniards were extremely bad road makers, and in fact let pretty well everything fall into decay—worse still—that which did not crumble by itself was vigorously helped by them. The Republic of Peru, founded in 1821, was sufficiently wise to grant liberal concessions to foreigners in order to attract foreign capital and enterprise, without which but little progress could have been made. Consequently a great deal has been achieved in the way of railroad construction, and some of these roads are among the triumphs of the engineering world. But, and it is a *big* but, next to nothing has been done towards direct communication between centres parallel with the littoral, although the lie of the land would favour it. If you wish to travel from one centre to another—southwards or northwards by modern means, you have invaribaly to journey to the coast, and thence by water to the port of the up-country centre you wish to visit. If you care to go by land, it means roughing it on mule or horseback and you journey along mere trails. The old Inca roads must have been constructed between the 12th and 16th centuries. In all probability they are the work of the last but one Inca, Huayna-Capac, the great civilizer and empire builder, that means about the end of the 15th century. The old Spanish scribes believed these roads to count among the wonders of the world, on account of the engineering feats performed in the construction thereof, and actually gave specific particulars which would point to incredible achievements. I have travelled over these roads at various interesting points and journeyed along their track for many a weary league, both in the lowlands and in the cordillera, but to me it appears that these ancient statements were exaggerations, for, after all, a 2,000 mile long pavement composed of solid boulders and rocks of 15 to 30 feet square, cannot crumble into dust, nor can hundreds of bridges, which are said to have been constructed on similar lines, disappear entirely; and yet of all the foregoing there is but little to be seen nowadays, and in but few places. The very noteworthy and most remarkable exceptions can hardly be held to prove the rule. On the other hand, the bare fact of having properly

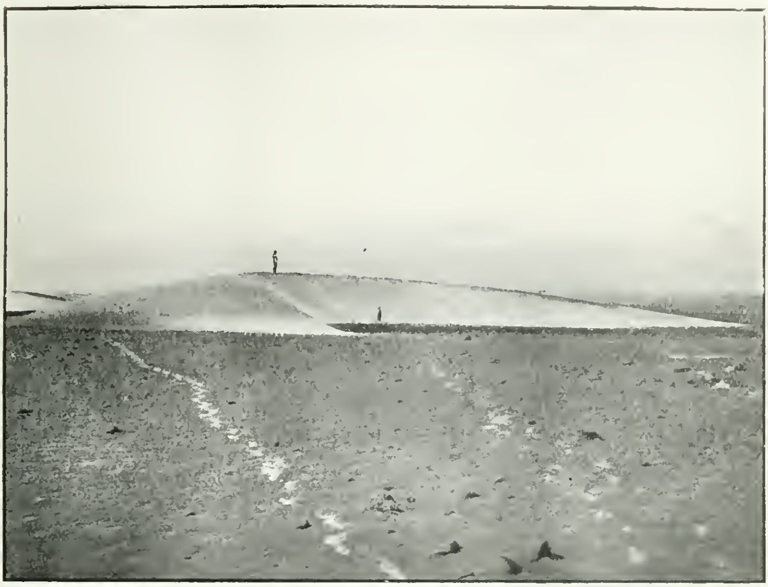

Fig. 9. Peru, Travelling Sanddune.

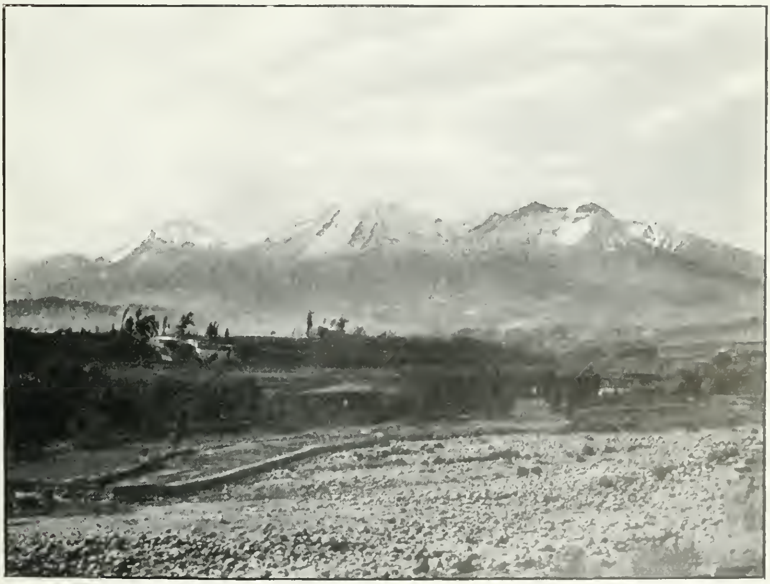

Fig. 10. Peru, View of the Andes from the Campiña, Arequipa.

maintained routes of communication between the various centres, must be looked upon as an achievement of great importance for that period, for the difficulties were all but unsurmountable for a people without efficient means of transport and construction. That the Incas could and did have most wonderful structures built, is of course beyond question, and I shall show a few specimens on which their fame is rightly based; but in the matter of their imperial roads, I regret not to be able to side with those who would have them appear in the light of say—the Roman Imperial Highways.

Cuzco—the former Inca capital of Peru—enjoys a beautiful situation in a valley surrounded by high mountains. It lies at an altitude of 11,400 feet, and is a place full of intense interest. The Palace of the Incas will give you an idea of the nature of their structures. The blocks of stone and rock used in the construction are 6 to 8 feet square, but there are many far larger. They were rarely cemented together, mortar was apparently unknown at that period. Occasionally gold or copper was used in its place though. The most wonderful edifice of all is probably the ancient fortress Sacsaihuaman, which is so situated that it commands all roads leading into the capital. (See Fig. 6.) The size of these rock blocks can be gauged by the height of the man standing by the wall. It is easy to imagine what a gigantic task it must have been for the Indians to transport these huge slabs through the extremely mountainous country, and to get them into position on top of one another without modern appliances. In those days the Peruvian uplands still had a considerable population, that is before the Spaniards decimated their numbers by their outrageous slave driving tactics. Doubtlessly these huge constructions were rendered possible by imperial commandeering on a similar scale to that in use in China, when the Great Wall was being built.

A further connecting link with the past is the llama. It appears to have been a sacred animal with the Incas. Tradition has it that the spirits of their dead passed into these animals which resulted in the latter carrying their heads high in the air in a very proud manner. The llama is the great stand-by of the inhabitants of the Andes, in fact they are largely dependent on it. This animal has always been to the Indian what a sheep, for its wool, a horse and cart for transport, a Chinaman for his cut rations, and chemicals for manure are to us. The llamas would appear to be members of a sort of Trade Union for they will not carry more than 100 lbs. in weight. Should more be packed on to them, they will lie down and not stir, notwithstanding the most cruel treatment.

In olden times there existed along the great routes an extraordinary system of Posting carried on by runners. These men lived in "Tambos" or rest houses situated at regular intervals. It was their duty to transmit to the next post all messages received from their neighbour. This was done at top speed, and as each man only had 4 or 5 miles to run to the next Post, news was carried at the rate of 100 to 200 miles a day from one end of the Empire to the other. This was not limited to messages, but food and supplies were likewise forwarded. Ruins still exist which are taken to be those of such Tambos. The imperial route is actually supposed to have crossed the mountains themselves. It sounds incredible, but there are numerous examples in existence in support of the theory. If it is anything to go by, it would appear that this has left its mark upon some of the present-day inhabitants who, in order to reach the other side of a mountain, prefer to climb over, than to go round its base. In places the trail leads over rocky ridges; and as the great plateaux are crossed one invariably passes trains of llamas bearing ore from the mines. (See Fig. 7.) Convenient valleys were, however, always utilized. The illustration shows a present-day bridge where in the past huge flags of stone and rock were supposed to have formed one. These bridges are made of woven grass and are extremely treacherous. There are various other sorts of bridges in use which, however, I have no time to deal with. As you cross the "llanos" the trail grows very broad, but there are no signs of stone flags measuring 10 or 20 feet. With one or two exceptions the market and trading centres do not impress one, nor does one's nightly resting place. It is not very inviting, and yet how very welcome; even the vile odours help to keep one warm. Nor is the type of Indian very prepossessing. Generally one arrives at one's halting place in the evening when it is growing dark and one does not mind much about anything, except food, warmth and sleep, but when one awakens and sees one's host and his friends in broad daylight—misgivings come quickly over one. As a matter of fact though they are extremely peaceful unless they are under the influence of their firewater. The native mile stones in these parts remind one more of infant pyramids than anything else.

Before leaving the mountains for the lowlands, the viaducts built by the Incas for irrigation purposes should not be overlooked, as they had apparently fully mastered this problem; further the Junin pampa should be mentioned, situated roughly speaking at 12,000 to 13,000 feet above sea level. On it stands a cross; this cross and the plain mean to Peruvians and South Americans in general almost what the field of Waterloo and the Lion monument mean to England and Europe. It is here that Bolivar in 1825, at the head of a mixture of Columbians, Peruvians and Argentines, beat the Spanish troops and prepared the way for the great Ayacucho victory, entering thereby on the final stage of the breaking up of Spanish rule in South America. At Waterloo it will be remembered the sunken road played a great rôle, at Junin it was a hidden lake—both made all the difference to the issue.

Numerous remains still exist of the great Coastal Road. The material used was apparently far inferior to that in the sierras. Ordinary earthen bricks, sand and adobe being utilized to a great extent. This road in olden times led over the plains across the foothills running more or less parallel with the ocean. At certain periods the view from some points of the coast looking eastwards is superb. You may see chain upon chain of towering mountains, the highest ridges of which are thousands of feet higher than any European eminence. As already stated the only means of communication across country between centres is on horse or mule back. The trail takes one through all conditions of country; desert land alternates with highly cultivated stretches. Rain being an extremely rare occurrence on the coast, vegetation is only found where rivers or streams attend to the irrigation. Sugar, cotton and rice grow in abundance in the latter districts, whereas the former frequently cover valuable deposits of salt, guano, petroleum and coal. The life on the estates and ranches is full of charm. Travelling during the so-called rainy season (when it pours in the sierra) makes one respect the dried-up looking streams which suddenly change into raging torrents, or broad stately rivers which may give your horse an exhausting and exciting mile's swim across. This is the heart of the earthquake zone, and plenty of fun and worry falls to everyone's share.

We now come to the railroads which are the modern highways; it is thanks to these that the great mineral wealth of Peru can be brought down to the coast. The most interesting one is the Callao-Oroya line, constructed by Meiggs, the daring American contractor and engineer. This railroad is a marvel of engineering skill, conception and execution. I will not go into unnecessary details, but you will gain an idea of its construction when I tell you that it rises to an altitude of 15,600 odd feet in about 136 miles. Mont Blanc is 15,782 feet high. How it zigzags up the sides of terrific precipices and winds in between steep ridges and runs through about three score tunnels—must be seen to be appreciated. The sheer audacity of some of its bridges takes away one's breath. The railroad starts at Callao.

I will pass Lima, the capital, without comment, for I feel I must digress no more. The Verrugas is the most interesting bridge on this railway. It spans a very deep valley, and is one of the highest in the world. Owing to an accident I was obliged to walk over the greater part on one occasion. There are huge iron girders, across these are laid wooden sleepers and over these the rails. You have to tread gingerly from one sleeper to another, and in between you gaze into space. Once—never again. Many of the conveniently situated valleys the railroad takes advantage of, have quite a Swiss look about them. The highest point is touched in a tunnel and one is then in the region of eternal snow, which sounds rather curious when one bears in mind that the latitude is but approximately 12° S. The run down the eastern slope brings one to Oroya at an altitude of 12,000 feet. The rivers no longer drain into the Pacific. When they finally reach an ocean—it is the Atlantic. Since I was there last, the railway extends a good deal further and nowadays connects with Cerro-de-Pasco, one of the most important copper and silver deposits of the world. (See Fig. 8.) I visited various mines and was able to fully realize how the Spaniards must have worked the Indians to death in order to secure supplies of ore; a couple of million of them are supposed to have been killed off in this manner. It is intended that this line should continue until it reaches the important ports on the upper reaches of the Amazon.

In order to reach the second modern route in Peru, the traveller is obliged to return to the coast. If he is fortunate in securing an open trolley and the services of an engineer,

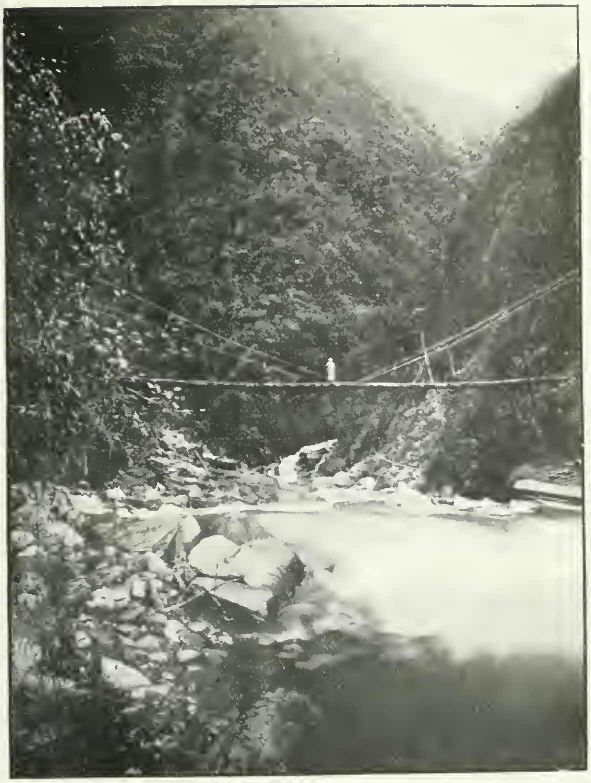

Fig. 11. Peru. Valley. Eastern Slope of the Andes.

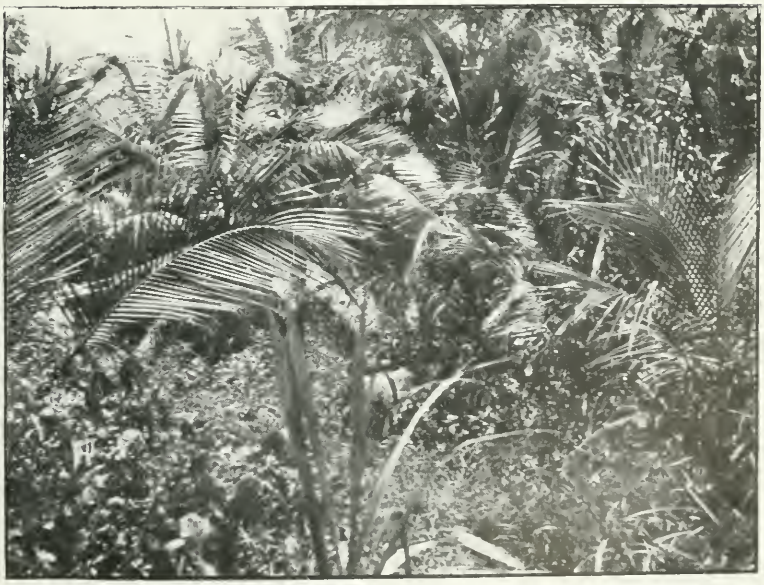

Fig. 12. Panama, Canal Jungle.

he may fly down the track on an off day. He dashes down the steep gradients, through tunnels, over bridges, along precipices at a terrific pace, with nothing but a firm hand and a clumsy iron bar-brake between him and eternity. It is a glorious sensation in that invigorating atmosphere.

The railroad through the South of Peru to Bolivia is not by any means as daring in its construction as the Oroya railway, nor are its gradients so severe, but it rises all the same to over 14,000 feet above sea level. It is a most important line for commercial purposes, offering transport facilities for heavy exports of ore of all descriptions, and llama and alpaca wool: besides permitting considerable local intercourse, which in turn, adds greatly to inter-port traffic on the Pacific. We might again begin at its starting point. Mollendo at the best is a very bad port. It is too exposed to the mood of the Pacific rollers. Frequently there is a tremendous swell which at times renders all communication impossible for days at a stretch between land and the steamers at anchor in the offing. Occasionally the views along the line are fine, but large deserts of sand are traversed too. It is here that one encounters the travelling sand dune. The wind on this particular stretch nearly always blows from the same quarter; it has the effect of blowing the particles of sand up hill until they topple over, and the dune gradually moves on its way up country. Strangely and inexplicably they have Feelers owing to their crescent shape. These dunes travel considerable distances and at times interfere with tracks and villages. Of course their progress is extremely slow. Note the size of mere man in comparison. (See Fig. 9.) Arequipa is the first big city the railway traverses. Its altitude is about 7,000 feet and its climate ideal. (See Fig. 10.) Its situation is extremely fine, thanks to the charming and productive campiña and also to the superb mountain scenery surrounding it, the partially active volcano Misti in particular furnishes a splendid background. Sun-set and sun-rise and the attendant pre- and after-glow are unforgetably beautiful. Arequipa appears to be a very suitable spot for astronomical work; the Incas who were versed in this science are known to have had an observatory there. The U.S.A. have maintained one there for many years, in fact the enterprise of the Harvard University does not stop at this undertaking, they actually have a recording station on the summit of the Misti at an altitude of 18,000 to 20,000 feet.

The atmosphere is extraordinarily clear and permits of views from the summit as many scores of miles distant as dozens in our country. At Juliaca the railroad takes a sudden turn to the south and reaches Lake Titicaca at Puno. Steamers attend to the transport across this intensely interesting inland sea situated at 12,500 feet above sea level. The country surrounding this strange lake forms the cradle of the Inca civilization. Students of archæology will find ample material in these parts for an attempt to connect the links of Inca civilization with that of the ancient Egyptians.

The railway resumes at the Bolivian end of the lake and terminates at La Paz, the capital of that country. During my time in Peru the important branch line from Juliaca to Cuzco was not completed.

The fertile valleys and rich sierras on the eastern slopes of the Andes, as yet untouched by railroads, depend for their development upon direct connection with the outer world. (See Fig. 11.)

In concluding my remarks on this section, I should mention that the shipping on the Peruvian coast, apart from the ocean going vessels, is largely occupied in the transport of the produce of one province to another which in return for, say cattle and firewater, sends cotton and wool or sugar and rice. The minor traffic is still carried on in some quarters in the very same manner as found by Pizarro and his followers in 1525; the old fashioned "balsas" being made use of in various of the small northern ports.

PANAMA CANAL ZONE.

The past history of this route can be recapitulated in a few words.

In 1513 the first Europeans crossed the Isthmus under Nuñez de Balbao, and a few years later Panama city was founded, where Pizarro fitted out his various expeditions destined to end in the conquest of Peru. It was for many years a sort of pivot on which the power of Spain turned in Central and South America. The only way across then was along trails through the jungle and swamps. In later years the Isthmus was incorporated in the Republic of Columbia, but succeeded in effecting its independence in 1903. The traffic across the Isthmus grew enormously, and in 1850-5 an American Company built a railroad across at very serious cost of

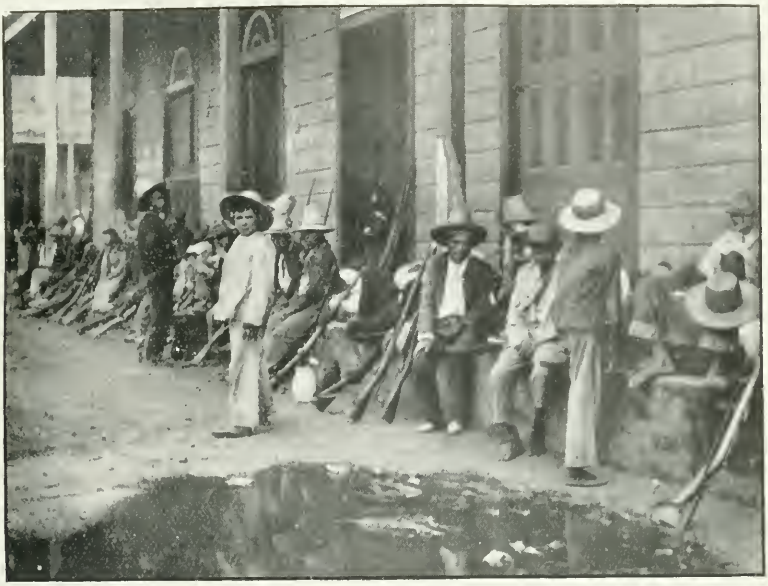

Fig. 13. Panama. After a Battle, Colon.

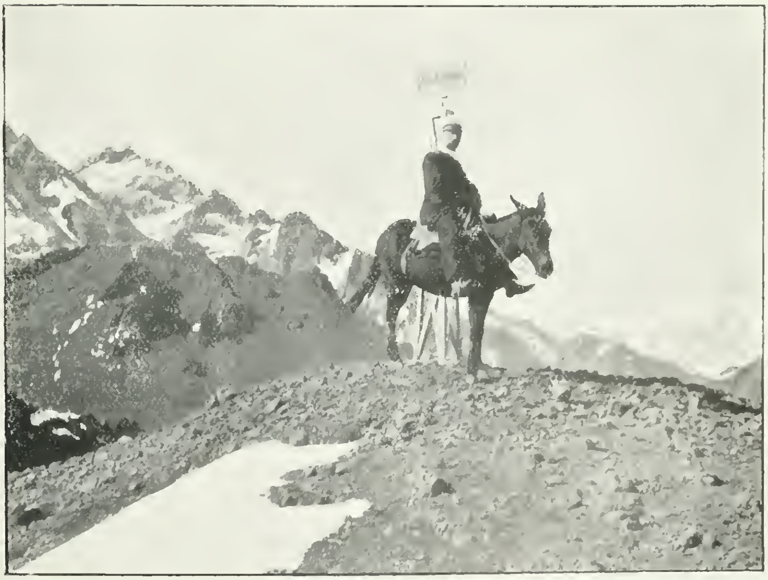

Fig. 14. The Chili-Argentine Frontier Post in the Andes.

life and kind, due to the treacherous nature of the virgin tropical soil. By counting the number of sleepers you are supposed to be able to gauge the approximate cost of life. In 1881 F. de Lesseps, the Frenchman, tried his hand at constructing a canal which should unite the Atlantic and Pacific—with what disastrous effects we all know; work was stopped in 1889. Latterly the U.S. Government have seen their way clear to undertake this costly task, and will thereby, after completion, have derived incalculable benefit for themselves and offer general advantages to the world at large.

The Isthmus is but about 20 miles broad at this point, but the nature of the country and climate make progress exceedingly difficult. Ridges of mountains, the Chagres river which should be a help but proves in reality a serious obstacle, treacherous swamps and tropical jungle, render the task so heavy that none but a very rich nation could ever dream of a successful termination of the work. (See Fig. 12.) We shall in a few years have specific particulars of this giant undertaking, so I will not dwell on incomplete statistics now. The Panama Canal is of course destined to play one of the greatest rôles a highway ever has done and must doubtlessly help to hasten the change of the trend of the commerce of the world. It will not only be of international importance from the point of view of transit, but must eventually become of great local interest too. Most of my visits to the Isthmus took place before Panama became an independent Republic. Active warfare was being indulged in most of the time, and the fighting was partly very real, hardly of the comic opera species, so often associated with Latin America. (See Fig. 13.)

The Transandine Route.

A regular route has always existed across the Southern Andes connecting the Pacific and Atlantic settlements, but it was nothing more than a trail, provided at intervals with sheltered dens made of rocks and stones. Conditions have altered and after almost half a century of irregular and interrupted effort owing to the usual South American trouble—revolution, and the consequent shortage of cash—a railway is nearing completion, which will establish direct communication between Valparaiso and Buenos-Aires. It will be the first railroad to cross the South American continent, and thus to connect the Pacific and Atlantic. The total distance to be covered is nearly 900 miles, of which some 10 to 20 still remain to be completed. Roughly 700 miles in the Argentine and over 100 in Chili have borne regular traffic for many years. In one feature the railway will resemble the wonderful Callao-Oroya line, in that it will pierce the highest part of the Andes it is obliged to traverse, by means of a tunnel. This will be at an altitude of close upon 10,500 feet, or considerably lower than the Peruvian line. The railroad, when completed, will reflect great credit on all concerned with the construction thereof, for they have had very serious difficulties to overcome and intricate problems to solve, owing to the treacherous nature of considerable stretches. Obviously this new route is bound to offer great advantages. The transit across the Continent will shorten by quite 10 days the journey to Valparaiso which as yet leads round the Horn, although it is not clear to what extent the transport of merchandise will benefit. In any case a great future awaits the Transandine service: doubtlessly in a few years one will be better able to gauge the full advantages likely to be derived.

It is some five or six years since I rode over that portion of the Mountain range which had not then been mastered by the railway. The scenery is very fine, and if one has the good fortune to be accompanied by men who know the country, and one has the requisite leisure, one may wander off the beaten track with advantage and enjoy views and sensations which are likely to last. (See Fig. 14.)

GEOGRAPHY AND SOME OF ITS PRESENT NEEDS.*

By A. J. Herbertson, M.A., Ph.D., Professor of Geography in the University of Oxford, President of the Section.

Geographical Progress in the Last Decade.

At the close of a reign which has practically coincided with the first decade of a new century, it is natural to look back and summarise the progress of geography during the decade. At the beginning of a new reign it is equally natural to consider the future. Our new sovereign is one of the most travelled of men. No monarch knows the World as he knows it; no monarch has ruled over a larger Empire or seen more of his dominions. His advice has been to wake up, to consider and to act. This involves taking existing geographical conditions into account. It will be in consonance with this advice if I pay more attention to the geography of the present and future than to that of the past, and say more about its applications than about its origins. Yet I do so with some reluctance, for the last decade has been one of the most active and interesting in the history of our science.

Among the many geographical results of work in the past decade a few may be mentioned. The measurement of new and the remeasurement of old arcs will give us better data for determining the size and shape of the Earth. Surveys of all kinds, from the simple route sketches of the traveller to the elaborate cadastral surveys of some of the more populous and settled regions have so extended our knowledge of the surface features of the Earth that a map on the scale of 1 : 1,000,000 is not merely planned, but actually partly executed. Such surveys and such maps are the indispensable basis of our science.

The progress of oceanography has also been great. The soundings of our own and other Admiralties, of scientific oceanographical expeditions, and those made for the purpose of laying cables, have given us much more detailed knowledge of the irregularities of the ocean floor. An international map of oceanic contours due to the inspiration and munificence of the Prince of Oceanographers and of Monaco has been issued during the decade, and so much new material has accumulated that it is now being revised. A comparison of the old and new editions of Krümmel's 'Oceanographie' shows us the immense advances in this subject.

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* Presidential Address to the Geographical Section of the British Association for the Advancement of Science, Sheffield, 1910, and submitted by the Society's Delegate, Mr. J. Howard Reed, F.R.G.S., to the Meeting of the Manchester Geographical Society held on Tuesday, Nov. 29th, 1910. The Delegate's Report will follow.

Great progress has been made on the geographical side of meteorology and climate. The importance of this knowledge for tropical agriculture and hygiene has led to an increase of meteorological stations all over the hot belt—the results of which will be of value to the geographer. Mr. Bartholomew's 'Atlas of Meteorology' appeared at the beginning, and Sir John Eliot's 'Meteorological Atlas of India' at the end of the decade. Dr. Hann's 'Lehrbuch' and the new edition of his 'Climatology,' Messrs. Hildebrandsson and Teisserenc de Bort's great work, and the recent studies of the Upper Atmosphere are among the landmarks of progress. The record is marred only by the closing of Ben Nevis Observatory at the moment when its work would have been most useful. To appreciate the progress of climatology, it is only necessary to compare the present number and distribution of meteorological stations with those given in Bartholomew's Atlas of 1899. I have not time to recapitulate the innumerable studies of geographical value issued by many meteorological services, observatories and observers—public and private—but I may call attention to the improved weather maps and to the excellent pilot charts of the North Atlantic and of the Indian Ocean published monthly by our Meteorological Office.

Lake studies have also been a feature of this decade, and none are so complete or so valuable as the Scottish Lakes Survey—a work of national importance, undertaken by private enthusiasm and generosity. We have to congratulate Sir John Murray and Mr. Pullar on the completion of a great work.

In Geology I might note that we now possess a map of Europe on a scale of 1:1,500,000 prepared by international co-operation and also one of North America on a smaller scale; both invaluable to the geographer. The thanks and congratulations of all geographers are due to Professor Suess on the conclusion of his classical work on the Face of the Earth, the first comprehensive study of the main divisions and characteristics of its skeleton. English readers are indebted to Professor and Miss Sollas for the brilliant English translation which they have prepared.

A new movement, inspired mainly by Professor Flahault in France, Professor Geddes in this country, Professors Engler, Drude, and Schimper in Germany has arisen among botanists, and at last we have some modern botanical geography which is really valuable to the geographer. I wish we could report similar progress in zoological geography, but that, I trust, will come in the next decade.

I pass over the various expensive arbitrations and commissions to settle boundary disputes which have in many cases been due to geographical ignorance, also the important and fascinating problems of the growth of our knowledge of the distribution of economic products, and powers, existing and potential, and the new geographical problems for statesmen due to the political, and economic revolutions in Japan and China.

It is quite impossible to deal with the exploration of the decade. Even in the past two years we have had Peary and Shackleton, Stein and Hedin, the Duke of the Abruzzi, and a host of others returning to tell us of unknown or little known parts of the globe. We hope to hear soon from Dr. Charcot the results of the latest investigations in the Antarctic. Further work is being undertaken by Scott and his companions, by Bruce, Amundsen, Filchner, and others in the South or North Polar ice worlds; by Longstaff, Bruce, and others in the mountains of India and Central Asia; by Goodfellow and Ryder in New Guinea; and by many other expeditions.

One word of caution may, perhaps, be permitted. There is a tendency on the part of the public to confuse geographical exploration and sport. The newspaper reporter naturally lays stress on the unusual in any expedition, the accidental rather than the essential, and those of us who have to examine the work of expeditions know how some have been unduly boomed because of some adventurous element, while others have not received adequate popular recognition because all went well. The fact that all went well is in itself a proof of competent organisation. There is no excuse for us in this section if we fall into the journalist's mistake, and we shall certainly be acting against the interests of both our science and our section if we do so.

THE POSITION OF GEOGRAPHY IN THE ASSOCIATION.

It was not my intention in this address to raise the question of what is Geography, but various circumstances make it desirable to say a few words upon it. We are all the victims of the geographical teaching of our youth, and it is easy to understand how those who have retained unchanged the conceptions of geography they gained at school many years ago cavil at the recognition of geography as a branch of science. Moreover, the geography of the schools still colours the conceptions of some geographers who have nevertheless done much to make school geography scientific and educational. Many definitions of geography are consequently too much limited by the arbitrary but traditional division of school subjects. In schools tradition and practical convenience have, on the whole rightly, determined the scope of the different subjects. Geography in schools is best defined as the study of the Earth as the home of Man. Its limits should not be too closely scrutinized in schools, where it should be used freely as a co-ordinating subject.

The present division into sections of the British Association is also largely a matter of practical convenience, but we are told that the present illogical arrangement of sections distresses some minds. No doubt there are some curious anomalies. The most glaring, perhaps, is that of combining mathematics with physics—as if mathematical methods were not used in any other subject. There is a universal tendency to sub-division and an ever-increasing specialization, but there is also an ever-growing interdependence of different parts of science. The British Association is unquestionably bound to take the latter into account, as well as the former. At present this is chiefly done by joint meetings of sections: a wise course, of which this section has been one of the chief promoters. It is possible that some more systematic grouping of sections might be well advised, but such a reform should be systematic and not piecemeal. It is one which raises the whole question of the classification of knowledge. This is so vast a problem and one on which such divergent opinions are held that I must apologise for venturing to put forward some tentative suggestions.

It might be found desirable to take as primary divisions the Mathematical, Physical, Biological, Anthropological, and

Geographical groups. Mathematical applications might be considered in each of the sections which use mathematical notions. In the Physical group there should be the sub-divisions Physics and Chemistry. Each would devote a certain proportion of time to its applied aspects or these might be dealt with in sub-sections which would include Engineering and Applied Chemistry. In the Biological group there would be Botany, Zoology, in both cases including Palæontology and Embryology, and Applied Biology, which would be dealt with in one or other of the ways I have suggested, and would include Agriculture, Fisheries, etc. (Medicine we leave out at present.) In the Anthropological group, in addition to the present Anthropology and Economics there should be a section on Psychology, which might or might not be attached to Physiology, and have the Education section as the practical appendage. In the Geographical group there would be the sub-divisions Geography and Geology, the practical applications of Geography and Geology being considered in joint meetings with other sections, or else in sub-sections—for instance, Geography and Physics for questions of Atmospheric and Oceanic Circulation, Geography and Economics for questions of Transportation, etc.

THE NEED FOR CLASSIFICATIONS AND NOTATIONS IN GEOMORPHOLOGY, ETC.

So much, then, for the classification of Geography with reference to the other sciences. I should like to say a few words about the sub-divisions of Geography and the vexed question of terminology. In the scheme of the Universe it is possible to consider the Earth as a unit, with its own constitution and history. It has an individuality of its own, though for the astronomer it is only one example of a particular type of heavenly bodies. As geographers we take it as our unit individual in the same way that an anatomist takes a man. We see that it is made of different parts, and we try to discover what these are, of what they are composed, what their function is, what has been their history. One fundamental division is into land, water, and air. Each has its forms and its movements. The forms are more obvious and persistent in the land. They are least so in the atmosphere, though forms exist—some of which are at times made visible by clouds, and many can be clearly discerned on isobaric charts. The land is the temporarily permanent; the water and atmosphere the persistently mobile, the latter more so than the former. The stable forms of the land help to control the distribution and movements of the waters and to a less extent those of the atmosphere. How great the influence of the distribution of land and water is on the atmosphere may be seen in the monsoon region of Eastern Asia.

The study of the land, the ocean, and the atmosphere has resulted in the growth of special branches of knowledge—geomorphology, oceanography, and climatology. Each is indispensable to the geographer, each forms an essential part of the geographical whole. Much research work is, and will be, carried on in each by geographers, who find their geographical studies hampered for the lack of it. As geographical progress is to a considerable extent conditioned by progress in these subjects, it would be legitimate to examine their needs. Time, however, will admit only a note on one of the barriers to progress in geomorphology—the lack of good classification and notation.

Geomorphology deals with the forms of the land and their shaping. Three things have to be kept clearly in view: (1) The structure, including the composition, of the more permanent substance of the form; (2) The forces which are modifying it; and (3) The phase in the cycle of forms characteristic of such structure acted on by such forces. We may say that any form is a function of structure, process, and time. The matter is even more complicated, for we have instances, *e.g.*, in antecedent drainage systems, of the conditions of a previous cycle affecting a subsequent one—a kind of heredity of forms which cannot be neglected. The geomorphologist is seeking for a genetic classification of forms, and in the works of Bertrand, Davis, de la Noë and Margerie, Penck, Richthofen, Suess, and Supan and their pupils are being accumulated the materials for a more complete and systematic classification of forms. As you all know, the question of terms for the manifold land-forms is a difficult one and apt to engender much more controversy than the analysis of the forms themselves. I believe that we shall find it advantageous to adopt some notation analogous to that of the chemists. I have not yet had time to work such a notation out in detail, but it might take the form of using different symbols for the three factors noted above—say, letters for different kinds of structure, Arabic figures for processes, and Roman figures for the stage of a cycle the form has reached.

Take a very simple set of structures and indicate each by a letter:

Structure … …

		Undisturbed.	Faulted.
homogeneous …	… …	A	A′
layered	horizontal …	B	B′
	tilted … …	C	C′
	folded … …	D	D′
mixed	… … … …	E	E′

If pervious or impervious, a *p* or an *i* could be added *e.g.*, a tilted limestone with faults would be C′*p*.

Next indicate the commoner erosion processes by Arabic numerals:

Process …

moving water … … …	1
ice … … … … … … …	2
wind … … … … …	3
sea … … … … … … …	4

One process may have followed another, *e.g.*, where a long period of ice erosion has been followed by water erosion we might write 2·1 where these alternate annually, say 21. The phase of the cycle might be denoted by Roman figures. A scale of V might be adopted and I, III, and V used for youthful, middle-aged and old-aged, as they have been called; or early, middle, and late phases, as I prefer to term them. II and IV would denote intermediate phases. A scarped limestone ridge in a relatively mature phase like the Cotswolds would be, if we put the process first—1 C′ III: A highland like the Southern Uplands would be denoted by the formula 1 . 2 . 1 E′ III. This is the roughest suggestion, but it shows how we could label our cases of notes, and pigeon-hole our types of forms—and prevent for the present undue quarrelling over terms.* No doubt there would be many discussions, for example, about the exact phase of the cycle, whether ice in addition to water has been an agent in shaping this or that form, and so on. But, after all, these discussions would be more profitable than quarrels as to which descriptive term, or place-name, or local usage should be adopted to distinguish it. The use of such notations in geographical problems is not unknown. They were employed by Köppen in his classification of climate; and now, in the case of climatology, there is coming to be a general consensus of opinion as to what are the chief natural divisions, and the use of figures and letters to indicate them has been followed by several other authors. This should also be attempted for oceanography. If any international agreement of symbols and colours could be come to for such things it would be a great gain, and I hope to bring this matter before the next International Geographical Congress.

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* What I wish to make clear is that it is not necessary to invent a new term for every new variety of land form as soon as it is recognised. It will suffice at first to be able to label it. The notation will also stimulate the search for and the recognition of new varieties.

The Need for Selecting Natural Geographical Units.

We have still to come to Geography proper, which considers land, water, and air not merely separately, but as associated together. What are the units smaller than the whole Earth with which our science has to deal?

When we fix our attention on parts of the Earth, and ask what is a natural unit, we are hampered by preconceptions. We recognise species, or genera, families, or races as units—but they are abstract rather than concrete units. The reason for considering them as units is that they represent a historical continuity. They have not an actual physical continuity such as the component parts of an individual have. Concrete physical continuity in the present is what differentiates the geographical unit. Speaking for myself, I should say that every visible concrete natural unit on the Earth's surface consisting of more than one organic individual is a geographical unit. It is a common difficulty not to be able to see the wood for the trees; it is still more difficult to recognise that the wood consists of more than trees, that it is a complex of trees and other vegetation, fixed to a definite part of the solid earth and bathed in air. We may speak of a town or state as composed of people, but a complete conception of either must include the spacial connections which unite its parts. A town is not merely an association of individuals, nor is it simply a piece of land covered with streets and buildings; it is a combination of both.

It is true that in determining the greater geographical units, man need not be taken into account. We are too much influenced by the mobility of man, by his power to pass from one region to another, and we are apt to forget that his influence on his environment is negligible except when we are dealing with relatively small units. The geographer will not neglect man; he will merely be careful to prevent himself from being unduly influenced by the human factor in selecting his major units.

Some geographers and many geologists have suggested that land forms alone need be taken into account in determining these larger geographical units. Every different recognisable land form is undoubtedly a geographical unit. A vast lowland such as that which lies to the east of the Rocky mountains, is undoubtedly a geographical unit of great importance, but its geographical sub-divisions are not necessarily orographical. The shores of the Gulf of Mexico could not be considered as geographically similar to those of the Arctic ocean, even if they were morphologically homologous. The lowlands of the polar regions are very different from those at or near the tropics. The rhythm of their life is different, and this difference is revealed in the differences of vegetation. I wish to lay great stress on the significance of vegetation to the geographer for the purpose of regional classification. I do not wish to employ a biological terminology nor to raise false analogies between the individual organism and the larger units of which it is a part, but I think we should do well to consider what may be called the life or movement going on in our units as well as their form. We must consider the seasonal changes of its atmospheric and of its water movements, as well as the parts of the Earth's crust which they move over and even slightly modify. For this purpose a study of climatic regions is as necessary as a study of morphological regions, and the best guides to the climatic regions are the vegetation ones.

By vegetation I mean not the flora, the historically related elements, but the vegetable coating, the space-related elements. Vegetation in this sense is a geographical phenomenon of fundamental importance. It indicates quality—quality of atmosphere and quality of soil. It is a visible synthesis of the climatic and edaphic elements. Hence the vast lowlands of relatively uniform land features are properly divided into regions according to vegetation—tundra, pine forest, deciduous forest, warm evergreen forest, steppe, and scrub. Such differences of vegetation are full of significance even in mountain areas.

The search after geographical unity—after general features common to recognisable divisions of the Earth's surface, the analysis of these, their classification into types, the comparisons between different examples of the types—seem to me among the first duties of a geographer. Two sets of studies and maps are essential—topographical and vegetational—the first dealing with the superficial topography and its surface irregularities, the latter relating to the quality of climate and soil. Much has been said in recent years—more particularly from this Presidential chair—on the need for reliable topographical maps. Without such maps no others can be made. But when they are being made it would be very easy to have a general vegetational map compiled. Such maps are even more fundamental than geological maps, and they can be constructed more rapidly and cheaply. Every settled country, and more particularly every partially settled country, will find them invaluable if there is to be any intelligent and systematic utilisation of the products of the country. Possessing both sets of maps, the geographer can proceed with his task.

This task I am assuming is to study environments, to examine the forms and qualities of the Earth's surface, and to recognise, define, and classify the different kinds of natural units into which it can be divided. For these we have not as yet even names. It may seem absurd that there should be this want of terms in a subject which is associated in the minds of most people with a superfluity of names. I have elsewhere suggested the use of the terms major natural region, natural region, district, and locality to represent different grades of geographical units, and have also attempted to map the seventy or eighty major natural regions into which the Earth's surface is divided, and to classify them into about twenty types. These tentative divisions will necessarily become more accurate as research proceeds, and the minor natural regions into which each major natural region should be divided will be definitely recognised, described, and classified. Before this can be done, however, the study of geomorphology and of plant formations must be carried far beyond the present limits.

The value of systematic and exhaustive studies of environment, such as those I suggest, can hardly be exaggerated. Without them all attempts to estimate the significance of the environment must be superficial guesswork. No doubt it is possible to exaggerate the importance of the environmental factor; but it is equally possible to undervalue it. The truly scientific plan is to analyze it and to evaluate it. Problems of the history of human development as well as those of the future of human settlements, cannot be solved without this. For the biologist, the historian, the economist, the statesman, this work should be carried out as soon and as thoroughly as is possible in the present state of our knowledge.

A beginning of systematic geographical studies has also been made at the opposite end of the scale, in local geographical monographs. Dr. H. R. Mill, one of the pioneers of geography in this country and one of my most distinguished predecessors in this chair, has given us in his study of south-west Sussex an admirable example of the geographical monograph proper, which takes into account the whole of the geographical factors involved. He has employed quantitative methods as far as these could be applied, and in doing so has made a great step in advance. Quantitative determinations are at least as essential in geographical research as the consideration of the time factor. At Oxford we are continuing Dr. Mill's work. We require our diploma students to select some district shown on a sheet of this map for detailed study by means of map measurements, an examination of statistics and literature which throw light on the geographical conditions, and, above all, by field work in the selected district. Every year we are accumulating more of these district monographs, which ought, in their turn, to be used for compiling regional monographs dealing with the larger natural areas. In recent years excellent examples of such regional monographs have come from France and from Germany.

The geomorphologist and the sociologist have also busied themselves with particular aspects of selected localities. Professor W. M. Davis, of Harvard, has published geomorphological monographs which are invaluable as models of what such work should be. In a number of cases he has passed beyond mere morphology and has called attention to the organic responses associated with each land form. Some of the monographs published under the supervision of the late Professor Ratzel, of Leipzig, bring out very clearly the relation between organic and inorganic distributions, and some of the monographs of the Le Play school incidentally do the same.

THE DOUBLE CHARACTER OF GEOGRAPHICAL RESEARCH.

To carry on geographical research, whether on the larger or the smaller units, there is at present a double need, in the first place, of collecting new information, and in the second place, of working up the material which is continually being accumulated.

THE NEED FOR THE SYSTEMATIC COLLECTION OF DATA.

The first task—that of collecting new information—is no small one. In many cases it must be undertaken on a scale that can be financed only by Governments. The Ordnance and Geological Surveys of our own and other countries are examples of government departments carrying on this work. We need more of them. The Presidents of the Botanical and Anthropological Sections, I understand, are calling the attention of the Association to the urgent necessity for complete Botanical and Anthropological Surveys of the kingdom. All geographers will warmly support their appeal, for the material which would be collected through such surveys is essential to our geographical investigations.

Another urgent need is a Hydrographical Department, which would co-operate with Dr. Mill's rainfall organisation. It would be one of the tasks of this department to extend and co-ordinate the observations on river and lake discharge, which are so important from an economic or health point of view that various public bodies have had to make such investigations for the drainage areas which they control. Such research work as that done by Dr. Strahan for the Exe and Medway would be of the greatest value to such a department, which ought to prepare a map showing all existing water rights, public and private. We shall see how serious the absence of such a department is if we consider how our water-supply is limited, and how much of it is not used to the best advantage. We must know its average quantity and the extreme variations of supply. We must also know what water is already assigned to the uses of persons and corporations, and what water is still available. We shall have to differentiate between water for the personal use of man and animals, and water for industrial purposes. The actualities and the potentialities can be ascertained, and should be recorded and mapped.

THE NEED FOR THE APPLICATION OF GEOGRAPHICAL METHODS TO ALREADY COLLECTED DATA.

In the second direction of research—that of treating from the geographical standpoint the data accumulated, whether by government departments or by private initiative—work has as yet hardly been begun. The topographical work of the Ordnance Survey is the basis of all geographical work in our country. The Survey has issued many excellent maps, none more so than the recently published half-inch contoured and hill-shaded maps with colours in layers. Its maps are not all above criticism; for instance, few can be obtained for the whole kingdom having precisely the same symbols. It has not undertaken some of the work that should have been done by a national cartographic service—for instance, the lake survey. Nor has it yet done what the Geological Survey has done—published descriptive accounts of the facts represented on each sheet of the map. From every point of view these are great defects; but in making these criticisms we must not forget (1) that the Treasury is not always willing to find the neccesary money, and (2) that the Ordnance Survey was primarily made for military purposes, and that the latest map it has issued has been prepared for military reasons. It has been carried out by men who were soldiers first and topographers after, and did not necessarily possess geographical interests.

The ideal geographical map, with its accompanying geographical memoir, can be produced only by those who have had a geographical training. Dr. Mill, in the monograph already referred to, has shown us how to prepare systematized descriptions of the one-inch map sheets issued by the Ordnance Survey. The preparation of such monographs would seem to fall within the province of the Ordnance Survey. If this is impossible, the American plan might be adopted. There the Geological Survey, which is also a topographical one, is glad to obtain the services of professors and lecturers who are willing to undertake work in the field during vacations. It should not be difficult to arrange similar co-operation between the Universities and the Ordnance Survey in this country.

At present the Schools of Geography at Oxford and at the London School of Economics are the only University departments which have paid attention to the preparation of such monographs, but other Universities will probably fall into line. Both the Universities and the Ordnance Survey would gain by such co-operation. The chief obstacle is the expense of publication. This might reasonably be made a charge on the Ordnance Survey, on condition that each monograph published were approved by a small committee on which both the Universities and the Ordnance Survey were represented.

The Geological Survey has in recent years issued better and cheaper one-inch maps, and more attention has been given to morphological conditions in the accompanying monographs; but it is necessary to protest against the very high prices which are now being asked for the older hand-coloured maps. The new quarter-inch map is a great improvement on the old one, but we want "drift" as well as "solid" editions of all the sheets. The geographer wants even more than these a map showing the quality of the solid rock, and not merely its age. He has long been asking for a map which would indicate the distribution of clay, limestone, sandstone, etc., and when it is prepared on the quarter-inch, or better on the half-inch, scale, the study of geomorphology and of geography will receive a very great stimulus and assistance.

The information which many other government departments are accumulating would also become much more valuable if it were discussed geographically. Much excellent geographical work is done by the Admiralty and the War Office. The Meteorological Office collects statistics of the weather conditions from a limited number of stations; but its work is supplemented by private societies which are not well enough off to discuss the observations they publish with the detail which these observations deserve. The Board of Agriculture and Fisheries has detailed statistical information as to crops and live stock for the geographer to work up. From the Board of Trade he would obtain industrial and commercial data, and from the Local Government Board vital and other demographic statistics. At present most of the information of these departments is only published in statistical tables.

Statistics are all very well, but they are usually published in a tabular form, which is the least intelligible of all. Statistics should be mapped and not merely be set out in columns of figures. Many dull Blue Books would be more interesting and more widely used if their facts were properly mapped. I say *properly* mapped because most examples of so-called statistical maps are merely crude diagrams and are often actually misleading. It requires a knowledge of geography in addition to an understanding of statistical methods to prepare intelligible statistical maps. If Mr. Bosse's maps of the population of England and Wales in Bartholomew's Survey Atlas are compared with the ordinary ones, the difference between a geographical map and a cartographic diagram will be easily appreciated.

The coming census, and to a certain extent the census of production, and probably the new land valuation, will give more valuable raw material for geographical treatment. If these are published merely in tabular form they will not be studied by any but a few experts. Give a geographer with a proper staff the task of mapping them in a truly geographical way and they will be eagerly examined even by the man in the street, who cannot fail to learn from them. The representation of the true state of the country in a clear, graphic and intelligible form is a patriotic piece of work which the Government should undertake. It would add relatively little to the cost of the census and it would infinitely increase its value.

THE NEED OF RECOGNISING THE GEOGRAPHICAL FACTOR IN IMPERIAL PROBLEMS.

With such quantitative information geographically treated and with a fuller analysis of the major natural regions, it ought to be possible to go a step further and to attempt to map the economic value of different regions at the present day. Such maps would necessarily be only approximations at first. Out of them might grow other maps prophetic of economic possibilities. Prophecy in the scientific sense is an important outcome of geographical as well as of other scientific research. The test of geographical laws as of others is the pragmatic one. Prophecy is commonly but unduly derided. Mendelyeff's period law involved prophecies which have been splendidly verified. We no longer sneer at the weather prophet. Efficient action is based on knowledge of cause and consequence, and proves that a true forecast of the various factors has been made. Is it too much to look forward to the time when the geographical prospector, the geographer who can estimate potential geographical values, will be as common as and more reliable than the mining prospector?

The day will undoubtedly come when every Government will have its Geographical-Statistical Department dealing with its own and other countries—an Information Bureau for the administration corresponding to the Department of Special Inquiries at the Board of Education. At present there is no geographical staff to deal geographically with economic matters or with administrative matters. Yet the recognition of and proper estimation of the geographical factor is going to be more and more important as the uttermost ends of the Earth are bound together by visible steel lines and steel vessels or invisible impulses which require no artificial path or vessel as their vehicle. The development of geographical research along these lines in our own country could give us an Intelligence Department of the kind, which is much needed. If this were also done by other States within the Empire, an Imperial Intelligence Department would gradually develop. Thinking in continents, to borrow an apt phrase of Mr. Mackinder's, might then become part of the necessary equipment of a statesman instead of merely an after-dinner aspiration. The country which first gives this training to its statesmen will have an immeasurable advantage in the struggle for existence.

THE NEED FOR THE ADEQUATE ENDOWMENT OF GEOGRAPHY AT THE UNIVERSITIES.

Our universities will naturally be the places where the men fit to constitute such an Intelligence Department will be trained. It is encouraging, therefore, to see that they are taking up a new attitude towards geography, and that the Civil Service Commissioners, by making it a subject for the highest Civil Service examinations, are doing much to strengthen the hands of the universities. When the British Association last met in Sheffield geography was the most depised of school subjects, and it was quite unknown in the universities. It owed its first recognition as a subject of university status to the stimulus and generous financial support of the Royal Geographical Society and the brilliant teaching of Mr. Mackinder at Oxford. Ten years ago Schools of Geography were struggling into existence at Oxford and

Cambridge, under the auspices of the Royal Geographical Society. A single decade has seen the example of Oxford and Cambridge followed by nearly every university in Great Britain, the University of Sheffield among them. In Dr. Rudmose Brown it has secured a scientifically trained traveller and explorer of exceptionally wide experience, who will doubtless build up a Department of Geography worthy of this great industrial capital. The difficulty, however, in all universities is to find the funds necessary for the endowment, equipment, and working expenses of a Geographical Department of the first rank. Such a department requires expensive instruments and apparatus, and, since the geographer has to take the whole World as his subject, it must spend largely on collecting, storing, and utilizing raw material of the kind I have spoken of. Moreover, a professor of geography should have seen much of the World before he is appointed, and it ought to be an important part of his professional duties to travel frequently and far. I have never been able to settle to my own satisfaction the maximum income which a Department of Geography might usefully spend, but I have had considerable experience of working a department the income of which was not very far above the minimum. Until now the Oxford School of Geography has been obliged to content itself with three rooms, and to make these suffice not merely for lecture-rooms and laboratories, but also for housing its large and valuable collection of maps and other materials. This collection is far beyond anything which any other university in this country possesses, but it shrinks into insignificance beside that of a rich and adequately supported Geographical Department like that of the University of Berlin. This fortunate department has an income of about £6,000 a year, and an institute built specially for its requirements at a cost of over £150,000, excluding the site. In Oxford we are most grateful for the generosity of Mr. Bailey, of Johannesberg, which will enable the School of Geography to add to its accommodation by renting for five years a private house, in which there will temporarily be room for our students and for our collection, especially those relating to the geography of the Empire. But even then we can never hope to do what we might if we had a building specially designed for geographical teaching and research. Again, Lord Brassey and Mr. Douglas Freshfield, a former President of this Section, have each generously offered

£500 towards the endowment of a professorship if other support is forthcoming. All this is matter for congratulation, but I need hardly point out that a professor with only a precarious working income for his department is a person in a far from enviable position. There is at present no permanent working income guaranteed to any Geographical Department in the country, and so long as this is the case the work of all these departments will be hampered and the training of a succession of competent men retarded. I do not think that I can conclude this brief address better than by appealing to those princes of industry who have made this great city what it is to provide for the Geographical Department of the University of Sheffield on a scale which shall make it at once a model and a stimulus to every other university in the country and to all benefactors of universities.

Proceedings of the Society.[*]

January 1st to March 31st, 1910.

The 842nd Meeting of the Society was held on Saturday, January 8th, 1910, in the form of a party for the children of the members. The Victorians, as usual, acted as hosts, and welcomed their guests at 5-30 p.m.

At 6-30 p.m. Mr. John Harrop kindly gave an exhibition of conjuring, which was highly appreciated by the children.

Light refreshments were served under the kind supervision of Mrs. Harry Sowerbutts in the Members' Room from 7-0 p.m.

At 8 p.m. Mr. W. H. Ward read an account of an "Austrian Hero," illustrated with lantern views, then followed an exhibition of a large number of amusing and other lantern views.

As usual a small toy was presented to each guest to serve as a reminder of a pleasant evening, and in conclusion the children gave a hearty cheer to thank all the helpers.

The 843rd Meeting of the Society was held on Tuesday, January 11th, 1910, at 7-30 p.m.

In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meetings held on December 14th and 21st and on January 8th were taken as read.

The death of the Rev. Canon W. C. Porter, a Life Member of the Society, was mentioned, and great regret was expressed that the Society, in common with the Mission Cause, had lost a valuable supporter.

The Election of the following Members was announced:—Ordinary: Messrs. T. W. Brownell and F. E. Neild; Associate: Mr. R. C. Bellamy.

Mr. F. W. Christian, B.A. gave a lecture entitled "From Island to Island under the Southern Cross: Wanderings in the South Seas," illustrated with a very large number of Lantern Slides.

The Chairman moved that the hearty thanks of the Meeting be given to Mr. Christian for his very interesting address and the motion was passed unanimously.

The 844th Meeting of the Society was held on Tuesday, January 18th,

In the Chair, Mr. F. Zimmern, F.R.G.S.

1910, at 7-30 p.m.

The Minutes of the Meeting held on January 11th, were taken as read.

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[*] The Meetings were held in the Geographical Hall unless otherwise stated.

The Chairman announced the Election of the following Members:—Ordinary: Messrs. G. H. Bell and J. J. Chadwick; Associate: Messrs. Leslie S. Pidd and A. S. Robinson.

Mr. James E. Liddiard, F.R.G.S., gave a Lecture entitled "In the Far North West—the Wonderland of Alaska—the Country, its People and its Treasures." The address was illustrated with numerous lantern views.

Mr. J. Howard Reed, F.R.G.S., moved that the hearty thanks of the Meeting be given to Mr. Liddiard for his interesting Lecture, the Chairman seconded the motion which was passed unanimously.

The 845th Meeting of the Society was held on Tuesday, January 25th, 1910, at 7-30 p.m.

In the Chair, Mr. R. Cobden Phillips.

The Minutes of the Meeting held on January 18th, were taken as read.

Mr. Wm. Thompson, President of the Burnley Literary and Scientific Club, described "A Walking Tour in the Tyrol," illustrating his address with a large number of lantern slides.

Mr. J. E. Balmer, F.R.G.S., moved, Councillor Anthony Burgon seconded and it was passed unanimously that the hearty thanks of the Meeting be given to Mr. Thompson for his very interesting address.

The 846th Meeting of the Society was held on Tuesday, February 1st, 1910, at 7-30 p.m.

In the Chair, Mr. R. Cobden Phillips.

The Minutes of the Meeting held on January 25th, were taken as read.

The Chairman mentioned the death of Mr. John Mather, who had been a member for almost twenty years, and it was resolved that the members present heard of the death of Mr. John Mather with great regret, and that their sympathy be conveyed to his relatives.

Mr. Frederick Stevenson addressed the Members on "Through the Lakes with a knapsack with the Manchester Pedestrian Club." The address was illustrated with lantern slides. On the motion of Mr. J. Stevenson Reid, seconded by Mr. Walter Higginbottom, it was resolved that the hearty thanks of the Society be given to Mr. Stevenson for his very interesting address.

The 847th Meeting of the Society was held on Tuesday, February 8th, 1910, at 7-30 p.m.

In the Chair, Mr. C. A. Clarke.

The Minutes of the Meeting held on February 1st were taken as read.

Miss Kate Qualtrough gave an address on "The Fascination of Geography," illustrating her remarks with lantern views.

On the motion of Mr. John R. Smith, seconded by the Chairman, a hearty vote of thanks was passed to the Lecturer for her interesting address.

The 848th Meeting of the Society was held on Tuesday, February 15th, 1910, at 7-30 p.m.

In the Chair, the Vice-Chancellor of the Victoria University of Manchester (Alfred Hopkinson, Esq., K.C., LL.D.).

Mrs. Arthur Schuster described "Sixty Days Marching through Ladak and Lahoul," illustrating her address with a large number of lantern views prepared from photographs taken by her on the journey.

Professor Sir Thomas H. Holland, K.C.I.E., in moving a hearty vote of thanks to Mrs, Schuster for her interesting address, referred to his visits to the same region; Mr. W. S. Ascoli, F.R.G.S., seconded the resolution which was carried unanimously with applause. Mrs. Schuster made a suitable response.

The 849th Meeting of the Society was held on Tuesday February 22nd, 1910, at 7-30 p.m.

In the Chair, Mr. John R. Smith.

The Minutes of the Meetings held on February 8th and 15th were taken as read.

The Election of Mr. Max Kalisch as an Ordinary Member was announced.

Mr. J. Howard Reed, F.R.G.S., gave an address on "The New South Africa." Mr. Reed traced the outline of South African development from the days of the early explorers, through the opening up of the country and the boom in diamond mining to the United South Africa movement. On this Mr. Reed dwelt in some detail, explaining carefully the Constitution of the new South African Parliament. The address was illustrated with an admirable set of lantern slides.

Mr. R. Emmett Hailwood moved and Mr. Walter Higginbottom seconded a hearty vote of thanks to Mr. Reed for his interesting address, and the vote was passed unanimously.

The 850th Meeting of the Society was held on Tuesday March 1st, 1910, at 7-30 p.m.

In the Chair, Mr. R. Cobden Phillips.

The Minutes of the Meeting held on February 22nd, were taken as read.

The Election of Mrs. J. Taylor Hughes as an Ordinary Member was announced.

Mr. Wm. Robinow described his journey in the far East under the title of "Eastern Impressions," and illustrated his remarks with a very large number of beautiful lantern slides of his own taking.

Mr. J. Howard Reed, F.R.G.S., moved, Mr. J. Reid Gray seconded and it was unanimously resolved that the hearty thanks of the Meeting be given to Mr. Robinow for the splendid slides, and for his interesting remarks explanatory of them.

The 851st Meeting of the Society was held on Tuesday, March 8th, 1910, at 7-30 p.m.

In the Chair, Mr. Walter S. Ascoli, F.R.G.S.

The Minutes of the Meeting held on March 1st were taken as read.

Mr. W. H. Zimmern gave an account of his visits to "Venezuela," and illustrated his address with original lantern views.

Mr. R. Kalisch moved and Mr. J. W. O'Leary seconded a hearty vote of thanks to Mr. Zimmern for the very interesting account which he had given of his journeys, and the resolution was passed unanimously.

The 852nd Meeting of the Society was held on Tuesday March 15th, 1910, at 7-30 p.m.

In the Chair, Colonel H. T. Crook, J.P., V.D.

The Minutes of the Meeting held on March 8th were read and approved.

Mr. Loris Emerson Mather, F.R.G.S., described his visit of "Five Weeks in the Soudan," illustrating his address with lantern slides prepared from his own photographs.

Colonel Crook moved, Mr. Clarke seconded and it was unanimously resolved that a hearty vote of thanks be tendered to Mr. Mather for the very interesting account of his journey which he had given.

The 853rd Meeting of the Society was held on Tuesday, March 22nd, 1910, at 7-30 p.m.

In the Chair, Mr. R. Cobden Phillips.

The Minutes of the Meeting held on March 15th were taken as read.

The Chairman referred to the loss by death of Mr. S.L. Helm, a member for twenty two years and a generous supporter of the Society in other ways; and moved that the sympathy of those present be conveyed to the relatives of the late Mr. Helm, the resolution being agreed to by all present rising in silence.

The Chairman announced the Election of Mr. Arthur Walkden as an Ordinary Member, and of Messrs. C. V. M. Edleston and C. R. Raby as Associate Members.

Mr. Richard Kalisch gave an address on "Trade Routes: Past and Present—East and West." (See p. 1.)

The address was illustrated with a very large number of original lantern views.

On the proposition of Mr. W. H. Zimmern, seconded by Dr. A. Rée, it was resolved that a hearty vote of thanks be given to Mr. Kalisch for his extremely interesting address and for the splendid slides shown.

Reviews.

"PRIMARY ATLAS OF THE BRITISH EMPIRE." Specially prepared under the direction of the League of the Empire. Edited by George Philip, F.R.G.S. London: G. Philip & Son Ltd.

This is a handy, cheap and for the purpose, an excellent atlas. There are several new features introduced which no doubt will go to make the book popular. The most important feature is the maps showing the climatic conditions for January and July, rainfall, vegetation and density of population. Each of the larger maps has inset a map of England and Wales on the same scale. This is a happy idea and one which will prove invaluable to the teacher. The treatment of the Nile Basin is exceptionally good. Teachers will undoubtedly find this a good atlas, and it should have a large sale. C. H.

"NEW SCHOOL ATLAS OF COMPARATIVE GEOGRAPHY." With a consulting index. London: G. Philip and Son, Ltd.

This atlas is one of the best yet published for half-a-crown. It contains several new features, namely, maps showing the climatic conditions, density of population, distribution of vegetation and rainfall. This should prove deservedly popular. As in all smaller atlases, there is the attempt to crowd too many names on some of the maps. For example, the physical map of the Scandinavian Peninsula, serves at the same time the purpose of the political map. It would have been much better to have published separate maps as an overcrowding of names distracts the student's attention and prevents thoughtful map reading. One would have liked the sea depths printed in three tints of blue. This would have been much better, especially in the case of the British Isle, when it would have shown the connection between these islands and the Continent. The lettering on the maps, too, is somewhat unequal; for example, the physical map of India has coarse printing and the political the finer printing. Apart from this, however, the atlas is an honest and praiseworthy attempt to introduce into school geography reason and interest. C. H.

Orographical Map of the British Isles." Compiled under the direction of H. J. Mackinder, M.A., F.R.G.S. Scale: 11·5 miles to an inch (1:728,640). London: E. Stanford, 1909.

The issue of another map in this splendid series of physical maps provides an opportunity to again bring them to the notice of the members. The special characteristics, as regards colouring, etc., already noticed in regard to the earlier maps in the series, apply to this map; and the name of the compiler is sufficient recommendation, especially to teachers, that the map will be satisfactory. Any slight errors, like one in the Eastern Counties mentioned by an expert, will not interfere with its general usefulness.

Correspondence.

TENTH INTERNATIONAL GEOGRAPHICAL CONGRESS.

Rome, 1st May, 1910.

Sir,—In accordance with the resolution adopted at the meeting of delegates at the Ninth International Geographical Congress (Geneva, 1908), the Tenth International Congress will be held in Rome in the week beginning October 15th, 1911, the year in which the National Commemoration Festivities for the proclamation of the Kingdom of Italy are to be celebrated.

The Organising Committee, in agreement with the Permanent Board founded by the Ninth International Congress, has the honour to invite the Geographical Societies and Institutes interested in or connected with Geographical Science, the Universities and other Institutions of Higher Education in which Geography is taught, explorers, geographers and students of Geographical Science, to attend the Congress, and to participate in its labours.

The Commemorative Festivities to which all those in Italy and abroad who are interested in visiting the capital of the Third Italy will be summoned, furnish a favourable opportunity for the meeting of the Congress. Care has been taken to fix the date in accordance with the wishes expressed by the Ninth Congress, and also as much as possible to suit the convenience of visitors coming from distant countries.

During the month chosen, while it will be easy to procure for the members of the Congress all possible comfort as regards hotels and other accommodation, the meetings of the Congress can be held under convenient conditions, notwithstanding the exceptional pressure which must be expected in connection with the celebration of the Commemorative Festivities.

As in Venice in the year 1881, during Third International Congress, learned people from any part of the world will have in Rome a hearty and honourable reception, and the Organising Committee is arranging interesting excursions to enable specialists to investigate *in situ* important phenomena of geographical interest.

The Committee begs you to follow the present invitation either personally or by sending delegates and to return the enclosed form, duly filled up and signed, in accordance with the annexed instructions, at your earliest convenience.

Yours faithfully,

For Organising Committee.

Marquis RAFFAELE CAPPELLI,
President of the Italian Geographical Society.

Commander GIOVANNI RONCAGLI,
Secretary General of the Italian Geographical Society.

THE ALTITUDE OF MOUNT HUASCARAN.

(A Communication from Mrs. Fanny Bullock Workman of Measurements made of Mount Huascaran, Peru.)

In 1908 Miss A. Peck, of U.S.A., claimed to have ascended the north, lower summit of Mt. Huascaran, in Peru. She made no instrumental observations above what she considers to be an altitude of 5,975 metres, 19,600 feet; but, from eye-estimates only, asserted that this peak had a height of at least 7,317 metres, 24,000 feet, and was thus the highest mountain of South America.

Believing Aconcagua to be the highest Andean peak, and, furthermore, to test the truth of these assertions, I decided to have a careful detailed triangulation made of the two summits of Mt. Huascaran. Through the assistance of Messrs. Fr. Schrader and Henri Vallot acting for the Société Génerale d'Etudes et de Travaux Topographiques of Paris, an expedition was sent to Peru for me under the direction of M. de Larminat to effect this purpose.

Assisted by the Peruvian Government and favourable weather, M. de Larminat and his assistants were able to carry out this work successfully between August and November, 1909.

A base 1,600 metres, 5,248 feet long, was measured in the Rio Santa valley in the Black Cordillera at an altitude of 3,800 metres, 12,464 feet. This base was measured by means of a 50 metre, 164 feet, tape of Invar metal. From two stations, one at either end of this base, and from two others, the positions and altitudes of which were determined by trigonometrical measurements from them, that is, from four stations in all, the positions and relative altitudes of the two summits of Huascaran were fixed by azimuthal and zenithal angles taken by theodolite.

In order to ascertain the true height of these stations above average sea level a progressive levelling was conducted from the highest station, called the Garganta Signal down along the mule-path leading from Yungay by way of Quillo to the sea at the port of Casma.

The Garganta Signal is higher than the col where the path between Yungay and Casma reaches its highest point. The difference in height between these two was ascertained by triangulation from the Garganta Signal to be 159 metres, 521·5 feet. From the col down to sea level at the port of Casma the levelling was performed by means of the tacheometer. The altitude of the Garganta Signal being thus established, it was an easy matter to fix the altitude of the other three stations, from which the triangulation of the summits was made.

From two of these stations from which it was visible the altitude of the church tower at Yungay was also established at 2,568 metres, 8,432 feet.

The average sea level was determined by four double observations of two water-marks made at intervals of six hours ten minutes between each. The agreement of these was satisfactory owing to the small amplitude of the tide at Casma, and also to the fortunate circumstance, that the observations were made at time of neap tide.

The results of these measurements show the height of the north peak of Huascaran to be 6,650 metres, 21,812 feet, and the height of the south peak 6,763 metres, 22,182 feet.

The Journal

OF THE

Manchester Geographical Society.

IN MEMORIAM.

The Rev. S. Alfred Steinthal, F.R.G.S.,
Chairman of the Council, 1890—1908.

The Rev. S. A. Steinthal, for many years chairman of the Council of the Manchester Geographical Society, and one of its Founders, passed away on May 6th, 1910. Mr. Steinthal was born in Manchester in 1826. His early education was received under Mr. Merz, an accomplished teacher, who founded the Chorlton High School. On leaving school Mr. Steinthal went to Bury to learn the business of a mechanical engineer. It was, however, a vocation for which he had no taste, and he therefore turned his thoughts to the work of the Ministry. Accordingly he entered Manchester New College in 1849, completing his course there in 1852. Mr. Steinthal's first pastoral charge was at the Unitarian Chapel at Bridgwater, where he became acquainted with some of the refugees from Hungary and through them he was brought into contact with their leader Kossuth who at that time was living in London. Having certain important confidential messages to send to his friends in Hungary, Kossuth arranged with Mr. Steinthal to deliver them verbally during a visit which he made to that country in 1859.

He remained at Bridgwater till 1857, when he went to Liverpool to act as a home Missionary, continuing in these arduous duties until 1862. In 1864 Mr. Steinthal began ministerial work in Manchester, accepting a call to the pulpit of Platt Chapel, Rusholme. Six years later he joined the Rev. William Gaskell in the pastorate of Cross Street Chapel, and when Mr. Gaskell died, in 1884, undertook the full charge of the church until 1894, in which year he retired from active ministerial work. Though now retired, he did not cease from giving much valuable service to the Unitarian Church. He represented the British and Foreign Unitarian Association at the Chicago Congress of All Religions in 1893.

In his younger days he supported the movement for the Abolition of Slavery in America. His interest in education was shown in many ways, he was the honorary secretary of the Manchester branch of the National Education League, at one time president of the Union of Lancashire and Cheshire Institutes, and his work at the Lower Mosley Street Schools will not soon be forgotten.

A great and permanent interest in his life was the study of geography. He had travelled in most of the countries of Europe, and also in Canada and the United States, witnessing the completion of the last section of the Northern Pacific Railway. He lectured very frequently on geographical subjects, especially dealing with the countries which he had visited. At the International Geographical Congresses held in Berne (1891), London (1895), and Berlin (1899), Mr. Steinthal represented the Manchester Geographical Society, of which he was one of the Original Members and for 19 years Chairman of the Council, presiding over the meetings of the Society with his inspiring zeal and informing remarks; and when in his last years he was unable to assist at the reception in Manchester of the famous explorers who have visited the city from time to time, it became the custom for such explorers to call upon him. Dr. Sven Hedin and Sir Ernest Shackleton both paid him this compliment.

Mr. Steinthal was a man of wide knowledge and varied accomplishment, enjoying all his life the esteem and attachment of innumerable friends.

LIFE IN ANNAM.

By Madame Gabrielle M. Vassal.

(Addressed to the Society in the Geographical Hall, on Tuesday, October 26th, 1909.

I begin by showing you a map of Asia, because I find so many people do not know where Annam is. If I tell people I am going out there they seldom venture any remark, or say, "Oh, that is where the tea comes from, isn't it?" and then I find that they are thinking of Assam, a British Colony.

When I became engaged to a French doctor I immediately began to learn up all about the French colonies. But even then, on my husband's appointment to the Pasteur Institute of Nhatrang, Annam, I was obliged to confess ignorance.

Annam is one of the five countries of French Indo-China. The others are Tonking, Cochin-China, Cambodia, and Laos. Tonking and Cochin-China are by far the most prosperous. The Tonkinese delta is one of the richest rice fields in the world. Cochin-China, too, is one huge plain of rice. Indeed, this country exports more rice than any other in the world except Burma—nearly one million tons a year. The Chinese, whose commercial instincts enable them to draw greater advantage from this colony than either the French or the Annamese, have most of the export business in their hands. They own the mills for decorticating the rice and also many of the boats in which it is exported to China, Japan, and the Philippines.

We first called at Saigon, the capital of Cochin-China. After visiting the beautiful harbours of Colombo and Singapore we were very disappointed when, at the Cap St. Jacques, we entered the Saigon river. From here the country was absolutely flat, swampy, and marshy. The bushes and the grass on either side of the river were covered with mud. The heat was almost unbearable. We wondered what sort of a town Saigon could be if it was built in the midst of all these marshes. We were, therefore, most agreeably surprised when we came one day to a most dainty town. The beautiful streets lined with trees, the artistic buildings and palatial residences make Saigon most attractive. We went for a drive, the "Tour d'inspection" as it is called, where everybody goes in the evening, and in spite of a few mishaps to our harness which our native driver had to keep tying together with string, we enjoyed it very much. When we returned to the town the streets were all lighted up, the cafés were overflowing into the road and the gay crowds round the little tables reminded one of the Paris boulevards. Saigon is indeed the Paris of the East. We liked it much better than "The Pearl of the Orient" as the Americans call Manila.

The next day we left Saigon by the French Messageries steamer which goes up the Indo-Chinese coast, and arrived twenty-four later in Nhatrang. It was here that we lived for three years. It was four o'clock when the boat stopped just outside Nhatrang bay. I was asleep on deck. It had been too hot to stay in the cabin, but at four o'clock in the morning it was cool. The sun was just rising and everything looked beautiful. I was so glad to see that we had left the flat country of Saigon, and here it was all mountains covered with forests. The blue sea was dotted about with green islands. A sampan took us to the shore. (See Fig. 1.) There are no piers or wooden landing stages in these small Annamese villages and we were landed through the breakers. I was rather taken aback to find myself seized by an Annamese only half my size, and carried through the breakers on to the sand, fortunately without accident. By the time we and all our luggage had been deposited on the beach all the children of the village had collected round us. As soon as we looked at them long they got frightened and ran away. But I managed to make one of them carry my bag for me and then they all grew familiar; even the sunshade which was protecting me from the sun was snatched from my head and carried in triumph up the beach. It was not a long drive to Nhatrang, but I had time to discover, by the misdemeanours of our native pony, that the roads in Annam are six or seven feet above the rice fields. Also, to my personal discomfort, that rice is grown in water.

Nhatrang is a village of three thousand inhabitants. There is also a small colony of Europeans, most of whom are engaged at the "Résidence"—the Government House of the Province—or at the Pasteur Institute, where my husband was working. Most people seem to connect Pasteur with hydrophobia, and

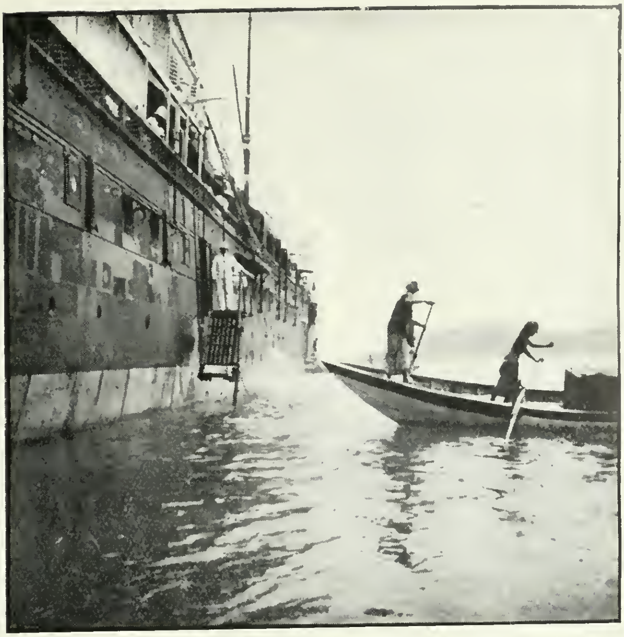


Fig. 1. Annam—An Annamese Sampan putting off from the Steamer.

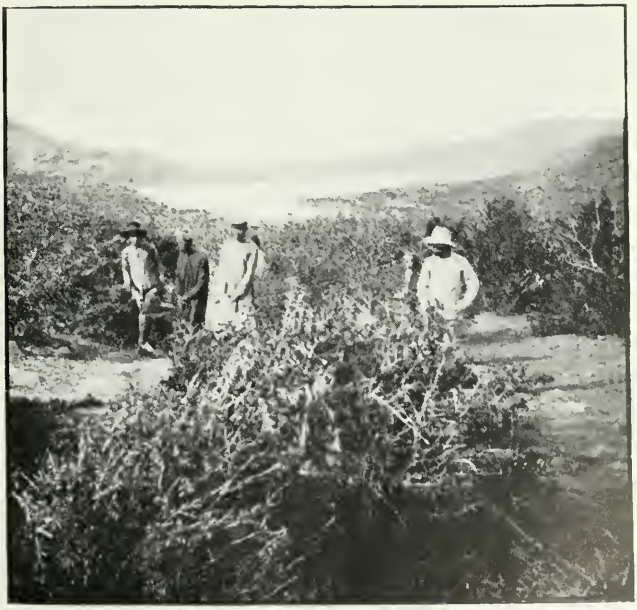


Fig. 2. Annam—Dr. Yersin with some of his herdsmen reviewing the cattle.

Pasteur Institutes with its treatment. Although this was one of Pasteur's greatest discoveries his fame rests rather on the fact that he opened a new field of science in microbiology. Microbes had been discovered before his time, but he was the first to show what wonderful results might be obtained from the study of them. The study of microbes and different parasites of the blood is undertaken here. Diseases such as malaria in man and rinderpest in animals are investigated through microscopic examination and other research work. Doctor Yersin, the director of this Institute was one of Pasteur's early pupils. It was he who discovered the cause of bubonic plague in the terrible outbreak which occurred in Hong Kong in 1894. Later he returned to French Indo-China and founded this Institute. His plague serum is also prepared here. A great number of horses and cattle are needed for the preparation of the serums, but as Nhatrang is on the coast and the soil sandy, the cattle are kept at Suoigiau, a village eighteen miles inland, where there is plenty of pasture. (See Fig. 2.) They are then sent to Nhatrang as they are needed for the serums. Suoigiau, or, as it is sometimes called on maps "Concession Yersin," has also been used as an experimental agricultural plantation. Coffee, tobacco, and coca for cocaine have been shown to grow well there, but now all these have been given up for the cultivation of rubber trees. It has been shown that these trees will thrive as well here as in Brazil or the Malay States.

Nearly all European houses are built in the bungalow fashion. No windows, just big doors, so that the sea breeze by day and the land breeze by night blow straight through and keep you comparatively cool. The kitchen, stables, and servants' quarters are built apart from the house as in India.

My first knowledge of the Annamese came through my servants. When we arrived we found five who had been engaged by a friend beforehand. As soon as we entered the house they went down on their knees, placed the palms of their hands on the floor, touched the ground with their foreheads, got up, went down on their knees again and repeated the same movements again and again. I wondered what they were doing, and my husband said that they were performing "laïs," which is a respectful greeting to a European or Mandarin. First of all I thought that they were boys or young lads. Then that they were women, and was most surprised to hear that they were grown up men, probably with children of their own.

However, they had such gentle manners and kind eyes that I thought they would be easy people to deal with. Unfortunately, I was mistaken! Almost the first time that I went into the kitchen I found my cook making the rissoles for our lunch by rubbing the meat up and down his bare body with his hands. Another time I told my boy to wipe a plate for me, and I was horrified to see him take the turban from his head. When I remonstrated with him he pointed out that this dirty, greasy rag was my new glass cloth which I had given him a day or two before. That was adding insult to injury. I suppose the red border had attracted him and he thought it might serve a double purpose. I used to try to teach my servants good habits but it was sometimes very difficult. For instance, I found that my boy did everything on the floor, washed the plates, cleaned the silver, always squatting on the ground, so I gave him a nice wooden table, but I found he preferred to sleep on the table and wash up under it. Then too, when he was ironing I would always place a bowl of water by his side with a sprinkler. But no, I found that he raised the bowl of water to his mouth, took a mouthful and then squirted it on to the parts that were too dry.

My cook used to cater for me. I knew no Annamese when I first arrived and he could speak very little French, so he used to go to the market every day and get what he thought we should like. He soon found out our tastes. I used to give him seven shillings a week, and for this he was supposed to provide us with meat, fish, fruit, and vegetables. You see things were not very dear in Annam. I think you could get a dozen bananas for a penny. A dozen eggs cost about fourpence, and a fowl sevenpence or eightpence. Then too, my cook used to find plenty of ways to supplement what I gave him. One day, a lady, our neighbour, came to me in the greatest distress and said that while she and her husband had been away twenty-four of their pigeons had been stolen. While sympathising with her I suddenly remembered that pigeons had often figured on our menu during the last week or so, and we had even congratulated the cook on doing us so well. In the same way we once ate somebody's pet rabbit.

Besides my troubles with servants I had a great many worries with insects. Before I had been in the house two days I found ants in my sugar, and in fact in all my eatables. By putting the legs of my sideboard in tins of vinegar I prevented them from going up there, but a little sugar spilt on the floor would bring thousands of ants within a few minutes, and I spent a great deal of time tracking lines of them from room to room, to find that their prey was a dead spider or a fly in a crack in the wall. Then too, I found beetles and cockroaches among our clothes, scorpions in dark corners, snakes in the garden, besides the pests of mosquitoes and flies. As it is well known now, it is the Anophelinæ mosquito which carries and gives malaria. If you can protect yourself from mosquitoes you can escape malaria altogether. For this purpose we protected our bedroom and dressing-room with wire gauze. Mosquitoes mostly bite at night, so this is the time to take precautions. I think it was owing to these arrangements that we neither of us caught malaria.

Men and women dress alike in Annam. (See Fig. 3.) Both have wide cotton white or coloured trousers and long indigo-blue tunics. Both have their long black hair done up in chignons at the back of their heads. The fact that the woman's tunic is a little longer than the man's and her hair done a little lower on the head does not at once strike the eye, and for a long time I could not distinguish the sexes. Both go bare-footed. Fortunately for the Annamese there is no fashion in hats. Men and women, summer and winter, it is always the same conical shape.

The Annamese are small and wiry, resembling the Japanese rather than the Chinese, although they originally came from a province south of China. In those days they were called the *Giao chi*, which means "separate big toe," and that is still a peculiarity of many natives. They wended their way southwards into Annam which means "The peaceful South." The Chinese sent rulers to govern them, but the Annamese always rebelled against the Chinese yoke and in the tenth century threw it off for ever.

The fishing village is on a strip of sand between the sea and the river. The fishermen keep their boats in the river and build their huts higgledy piggledy on this narrow strip of sand. During the high tides of October and November a few of these huts are always washed away. The Annamese just crowd into those left standing, and as soon as the weather is calm again they build their huts in exactly the same position again. We often went through this village in the early morning on our way to the other side of the river to shoot. As long as it was dark nobody was to be seen or heard, but with the first ray of sun the householder would come to his door. He would push it outwards and support it on two sticks, so that it made a little porch during the day. Standing there he would scrape his fingers through his hair and re-twist his chignon—his costume was then complete. After him would come the children, chickens, pigs, dog, all of whom had slept together during the night, glad to be in the light and air again. Then the mother would appear carefully sweeping all round the hut. She rather neglected the dark corners inside, but a certain space all round was kept free from twigs and banana skins. She would then make the camp bed, where all the family had slept during the night, into a little shop during the day. She would place there oranges and bananas and eggs, bright coloured stuffs, betel leaves for the betel chewers, cigarettes for smokers, and would thus make a few "cents" during the day. All Annamese chew the betel nut, which makes a red juice in the mouth, and this they spit out anywhere and everywhere. Their lips become discoloured and swollen from this habit. Also they often lacquer their teeth black to preserve them, so that the mouth is not a very attractive feature.

At the end of the strip of sand was a ferry boat which crossed the river from daybreak to sunset. It was generally full of women going to market. All you could see was just a jumble of hats and baskets. A few more women crowded in than the boat would really hold. The ferryman did sometimes make a feeble protest, but he was always met by such a storm of abuse from the last comers that he did not try to insist—and what could one poor man do against so many women, especially women who have such loud voices and extensive vocabularies as the Annamese. Then too, if the boat did overturn there was no accident from drowning because everybody in the fishing village, men, women, and children can all swim. But woe to the man who was the cause of a woman losing an orange or a few handfuls of rice! As soon as the boat came to land the women started off for market. (See Fig. 4.) They never walked abreast, always one behind the other. However, this did not prevent them carrying on a running conversation, and the woman right in front would chat without ceasing to the woman behind without ever turning her head or slackening her pace. Annamese women do not walk as we do. They trot along on the soles of their feet with a swinging movement. They carry

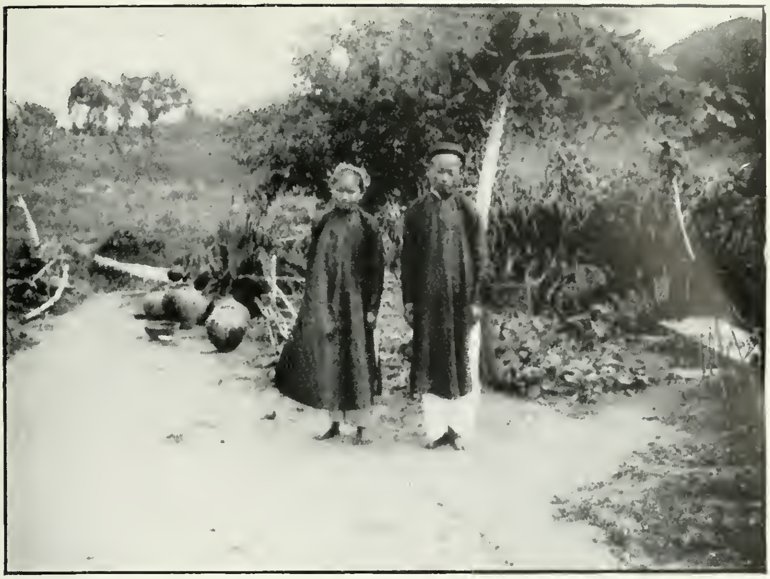


Fig. 3. Annam—A Newly-married Couple.

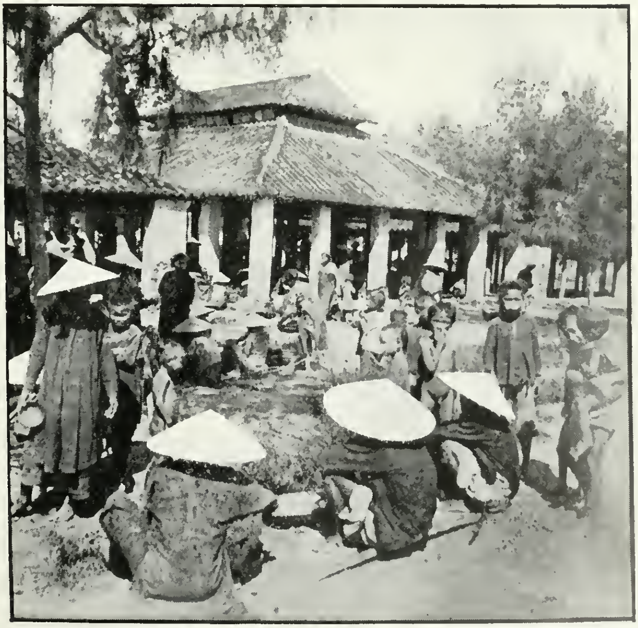


Fig. 4. Annam—Women at the Native Market. (By permission of Wm. Heinemann, of London.)

their goods in baskets which are hung to a bamboo over their shoulder. These are like a pair of scales and must be of equal weight. Sometimes you see a woman who has been unable to leave her baby at home, so she puts it into one of the baskets and it makes weight with a sucking pig in the other.

Girls before they are married generally stay at home to mind the younger children. It is they who fetch the water from the nearest well morning and evening. The little boys, if they don't go to school, are sent out to look after the herds of water buffaloes. These buffaloes are very dangerous to Europeans in Annam, but a native, even a little naked lad of eight or nine can manage a whole herd. He has grown up with them and can make them do as he will with his shrill little voice and whacks from his little cane. It is very amusing to see these children taking the animals across the river in the evening. They climb on to the backs of their favourite buffaloes by means of their tails, and standing upright, drive the whole herd across from this elevated position.

The men are mostly occupied in the rice fields. In the rainy season when the fields are full of water they plough them with the help of their water buffaloes. Afterwards a harrow is run through. They stand on the harrow which is just beneath the water, balancing themselves by means of the tails of their buffaloes. (See Fig. 5.) The rice meanwhile has been sown in a corner of the field. Directly the shoots appear above the water they are planted out one by one right across the fields. For this purpose the women are also employed. You sometimes see twenty or thirty in a long line. They tuck up their trousers for they are nearly up to their knees in mud, pushing down the green shoots into the soft earth.

The occupations in a Mandarin family are naturally very different. There is no permanent aristocracy in Annam except in the Royal family. Titles are not hereditary. They lose one degree with every generation, so that if men do nothing to gain honours personally the title soon becomes extinct. Most titles and government positions correspond to certain examinations. It is of good omen to the country that it should be governed by the best educated, and if only the Annamese would turn their attention to modern science instead of continuing to study the ancient Chinese and Japanese characters and the maxims of Confucius the country would progress more quickly than at present. Occasionally a man gains a title who has opened up a certain amount of waste land, turning it into rice fields, but he never enjoys the esteem of the people so much as one who has gained the same honour by learning. Learning is held in the highest esteem in Annam. There is a good communal school in every village throughout the country. Little boys are never so happy as when running to school, book and umbrella under their arm.

A mandarin's house is built of brick with tiled roof, very much like the houses of Europeans. In front of the principal entrance stands a stone or cement screen which prevents you looking straight into the room.

The Annamese are very hospitable, and we often used to call on them. (See Fig. 6.) They always offered us tea or other refreshments. On our first visit to the Quan Bô, which is the name given to the Annamese Governor of the Province, we were offered some tea. The eldest son did the honours, and poured it out. Finding that the teapot did not pour very well I saw him suddenly take it up, put the spout in his mouth and blow lustily down it.

The children of the Annamese are called one, two, three, according to the order in which they come. At least the wife is called "one," the eldest child "two," the second "three," and so on. I had often wondered why the servants frequently had the same name. Of course, the same names recur in every family. They have nick-names too, but these are of a most uncomplimentary character, such as "pig," "dog," "dirt," "manure heap," "worry," "nuisance." The mothers think that if they give their children an endearing name the "Ma Qui" (the devils) will want the child and it will die. So when a mother shows you her baby you must not say, as you would here, "Oh, the little darling, and how well he looks!" It is far better to say, "Oh, the horrid little creature, and in what bad health!" Then the mother is quite satisfied. She knows she will keep her baby. It is an insult to mention the surname, or family name. This is kept for business deeds and for the ancestral tablets.

Annam, unlike Tonking and Cochin-China, is only a Protectorate, and the governors still have a great deal of authority, receiving their orders direct from the Ministers at Hué. They are considered as the father and mother of the people they rule. They are supposed to look after them as parents would their children. The people, in their turn, have to provide their rulers with all they want. The official salary is very small.

There are three religions prevalent in Annam, Buddhism, Taoism, and Confucianism. By nature the Annamese is very indifferent to religious distinctions and will worship in one temple just as soon as in another, the distance or pecuniary advantage alone guiding him in his choice. Then too, the religions are very much mixed up. You will sometimes find the deities of all three religions on one altar. The Annamese also believes in a whole multitude of good and evil spirits. There are the spirits of the air, the spirits of the sea, the spirits of the elements, and the spirits of the rice fields, or whatever occupation a man is engaged in. Shrines are raised to these spirits and offerings are made in them. The village has sometimes quite a number of these temples and shrines belonging to it. Round Nhatrang a great many shrines have been raised to the tiger. The tiger has, and is still making numbers of victims in Annam. In fact he has come to be regarded as a god. The Annamese never mention him without his title. They always call him "Ong Kop" (my lord tiger). Sometimes a European has laid a trap and caught a tiger. When the natives living round about have discovered his august presence in the morning they have collected round the trap, begged him to forgive the insult which has been offered to him, made a great tam tam with their clapping instruments and let him go. In these circumstances it is useless to ask an Annamese to act as beater in a tiger hunt. They think that he would not only take his revenge on them but on their whole village.

But the faith which really takes hold of the Annamese and guides him in all the practices of everyday life is ancestor worship. This faith makes a man respect old age and be devoted to his children. It is the oldest man in the home who rules the household. Nothing is done without his consent. A man will take advice from his mother rather than his wife. This faith is also the reason that polygamy is customary. A man must have a son, who will do for him what he has done for his fathers, and who will carry on the ancestral chain. The rich Annamese often have several wives, but the poor only one unless they have no son. Believers in ancestor worship have beautiful tombs. In Annam they are of stone and sculptured. A man will live with his family all his life in some wooden hut with thatched roof and mud floor, but when he dies he must have a stone tomb. What is fit for the living is not worthy of the dead.

At certain times of the year there are feasts to the ancestors. These are most important ceremonies, and no member of the family must be absent from them. The father is the officiating priest. He stands by the altar on which are placed fruit and different offerings. Then he calls to the souls of his parents, grandparents, great-grand parents, and all his ancestors to come and join the family there assembled and partake of the food on the altar.

Ancestor worship also makes the death and burial of a man an event of great importance. I remember a mandarin coming to my husband one day to ask him to attend his brother, who was seriously ill. They were all in the greatest distress when they heard that the man had not long to live. My husband was rather surprised at such grief, because the Annamese seldom show their feelings. However, when he returned a day or two later he found them calm and almost cheerful. He thought that some miracle must have taken place,but on making his way to the sick man's apartment he found that that was not the case. The patient just raised himself on his elbow, and with a smile showed a beautiful coffin. Now that everything was ready he could die in peace. On my husband's first visit no preparations had been made. Sometimes on entering quite a poor man's home we noticed that the best article of furniture was the coffin. It was always the richest that he could afford.

When a man dies a piece of cloth is placed over his chest so that his last breath shall pass into it. This is afterwards rubbed over the ancestral tablet, and in this way the soul is supposed to be transferred to it. The cloth is afterwards carried in what is called "the chariot of the soul," which is part of the funeral procession. In a funeral procession first come the musical instruments, such as Chinese violins, flutes, and drums. Then come the mourners, who are always dressed in white. They are supported by their servants to show that they are bowed down with grief. Then comes the "chariot of the soul," and after that the catafalque, which is borne by a great number of coolies. The richer the funeral the more coolies there are. On the catafalque is the coffin. A man stands on the catafalque behind the coffin. He is a sort of master of the ceremonies, and directs the coolies. The coffin must be kept absolutely level. So when they come to uneven ground he places a glass

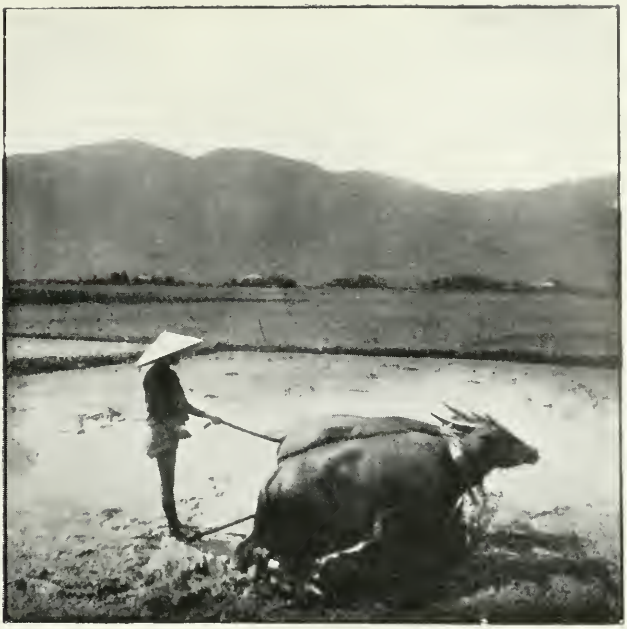


Fig. 5. Annam—On the ricefields. (By permission of Wm. Heinemann, of London.)

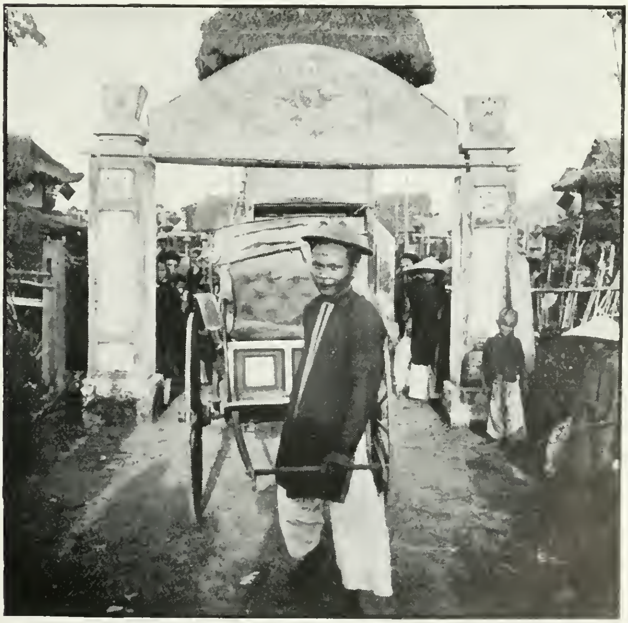


Fig. 6. Annam—A Mandarin's rickshaw coolie.

full of water on the catafalque in front of him. Then he promises five cents, ten cents, fifteen cents to every coolie if not a drop is spilt. After the catafalque come the women wailers, who weep and tear their hair.

The Têt, which is the name of the Annamese New Year, is the greatest fête in the calendar. For a week or ten days the Annamese go in for all kinds of festivities. There are races on land and sports on the water. The chief feature is the procession of the dragon. The dragon is often about thirty yards long. It is carried by men inside with torches, so that the markings on the skin are lighted up. It is a most terrifying looking object with the fire which comes spurting out of its eyes, mouth, and nostrils.

Then all kinds of acting take place at the Têt. There are really literary pieces in the Annamese language, tragedies, and comedies. But Nhatrang being a small out of the way village we did not get good troupes of actors, and only saw pantomimic farces. The acting consisted of queer contortions of the hands, arms, feet—toes outspread. Then blood-curdling shrieks and whirling, twirling movements. The characters were such as a man, a woman, a child, a cock, a tiger, etc. The pieces lasted two or three days, the actors only stopping for their meals. However, the Annamese are most enthusiastic playgoers, and a good audience is never wanting. The Annamese do not applaud as we do by clapping their hands. There is a gong placed near the stage, and when anybody in the audience sees or hears something he wishes to show his appreciation for he gets up, goes to the gong and bangs it. Needless to say, the gong is being banged the whole time.

And now I should like to say something about the Mois, the aboriginal people of the country. Annam is a long but very narrow strip of country; in fact, there is very little level land between the sea and the mountains. The Annamese never leave the plains or go into the hills of their own accord. This hill country is inhabited by wild hill tribes called the Mois. The Annamese have driven them from the fertile country, and now you can only find them in the rocky mountainous country or in the depths of the forest. The word *Mois* in Annamese means savage, and the word is typical of all these tribes. They are quite different from the civilised Annamese. They wear very little clothing. (See Fig. 7.) They do not know the use of money, and writing is absolutely an unknown art. The Annamese have the greatest contempt for them.

We lived among the Mois for eight weeks, because a year after our arrival in Annam my husband was sent on a mission to the Langbian plateau in south Annam. This plateau was fifteen hundred feet above the sea, and it was proposed to build a sanatorium up there. My husband was asked to make a report as to the suitability of this enterprise. It was two hundred kilometres from Nhatrang, all of which had to be done by rickshaw to the foot of the mountain, and after that we had to ride or be carried in palanquins up the mountain side. As soon as we were a few hundred feet above the plain the temperature became cooler, and the journey was most agreeable. The scenery was beautiful. We passed alternately through tropical jungle and forests of pine trees. The plateau itself was about eighteen kilometres long by 20 kilometres wide, composed of rounded hillocks covered with short grass. It was most amazing to find this plateau after all the wooded and rocky country we had been going through. Here we were amidst the Mois. The nearest Annamese village was a hundred and fifty kilometres away. On our first visits to Moi villages all the inhabitants ran into their huts and hid themselves. But when I visited the same village alone a little later I met with a very different reception. Directly they found out that I was a woman they had no fear of me, and all surrounded me. I was even able to give all the children lumps of sugar. After a time I ventured inside a hut. In most villages the huts are large, and contain quite a number of families. They are quite dark, for there are no windows or chimneys. Then, as fires are always burning, they are full of smoke. I had to bend low to go in, for the door is not much more than a hole in the roof. As soon as I got inside there was a scuffling round my legs. The dogs of the hut resented my intrusion. However, pieces of wood were thrown at them from out of the darkness, and they retired. I made my way towards the fire at the end of the hut, round which I could see forms of men or women lighted up. I kept stumbling over baskets, bows and arrows, etc., which had been left strewn about the floor. As soon as I got alongside of the group I squatted down beside them. There were men and women. Most of the latter had a baby in their arms. They were smoking, passing the pipes to one another. One man passed his pipe to me. They all talked together, but, of course, I could not understand what they said.

Sometimes when I visited a Moi village the women would surround me and take me into some small, empty hut, and no man would enter at all. They would then squat round me and examine me, my hands, my feet, my hair, and compare them with their own. They did not admire my ears, for the Mois women in the villages round the plateau all enlarge the lobes of their ears. This is a sign of beauty among them. When children they put a little piece of bamboo through the lobes of the ear. They increase this bamboo in size until it is as large as the top of a cup and the skin is stretched to breaking point. Then they take out this wedge of wood and place there heavy metal ear-rings, which come down over the chest. When a Moi woman runs she holds these ear-rings against herself. I thought she was afraid of them breaking, but she is not so much afraid for her ear-rings as for her ears. And this accident frequently happens. The ears of the older women of a village do break, and these two thin pieces of skin hanging down on either side of their faces is a most repulsive sight. The men do not deform their ears in the same way, but many of them grind down their front teeth to the gum. It is done with pummice stone, and is a most painful operation, lasting two or three days. However, a youth rarely shrinks from it, because from that time forward he is considered no longer as a boy but as a man.

When the Mois travel from one village to another they carry their goods in baskets, one on the top of the other on their back, so that there is a regular scaffolding which towers above their heads. They cannot remove their burdens without help, so that in order to rest their shoulders a stick is attached to the bottom basket with a piece of string and drags along behind. When they stand still this stick is propped underneath the baskets, which relieves the weight. There is a story that when the first Europeans left the coast and went into the Interior they came back saying that they had seen a race with tails. If the story is true, what they probably saw were these Mois walking along one behind the other with the sticks trailing behind them.

There is one rather gruesome ceremony which takes place in the villages round the plateau, and that is a buffalo sacrifice. This is to get rid of an epidemic or for some other misfortune.

The buffalo is attached to a highly ornamental stake the night before. In the morning when the sun has risen to a certain height above the horizon, the chief of the village, dressed for the occasion in Annamese clothes, comes and makes an oration in front of the buffalo to the assembled village. Then at a certain signal two Mois dash forward and hack at the buffalo's front legs so that it falls on its knees. The priest then cuts its throat with a dagger, and a number of Mois rush forward and finish it off with their lances. The priest gathers up the blood from the animal's throat in a bowl and carries it into one of the huts. The ceremony is then at an end. After that the whole village cuts up the animal and divides the flesh, and a huge feast is held. The epidemic often rages worse than ever.

The Mois have no thrift. They do not think of drying some of the meat and keeping it for a little later. They never even sow enough rice, and the six months after the harvest is followed by six months' starvation. During that time the Mois will feed on snails, slugs, etc., roots, and herbs from the forest if they cannot get enough by hunting with bow and arrow or fishing.

Before leaving the plateau we went for an excursion to the Hinterland beyond. I cannot tell you the names of the villages we passed through, or rivers we crossed, because no map has as yet been made of this region. (See Fig. 8.) In fact, few of the inhabitants of the villages had ever seen a white woman before. The Moi chiefs of the plateau, whom we had got to know, accompanied us as an escort. Our coolies we changed at every village, in this way we did not keep them too long from their homes.

Our first night was spent on the confines of a huge forest. Our Moi chiefs parleyed for a hut where we might sleep. However, when I saw all the inhabitants coming out of the one that was to be given us I really felt as if I could not sleep there. But one cannot expect first-class hotels in Moi country, and one cannot sleep outside because of the tigers. When the fires were put out, and our camp beds and mosquito curtains put up, it looked a little more habitable. We had dinner outside, but when we retired about seven o'clock to bed I found I had not made the worst discovery. The whole place was moving with cockroaches. There were fifty drowned in the basin on the floor which I had just washed in. Every time I knocked my head against the low roof I got some of them in my hair. I tied my

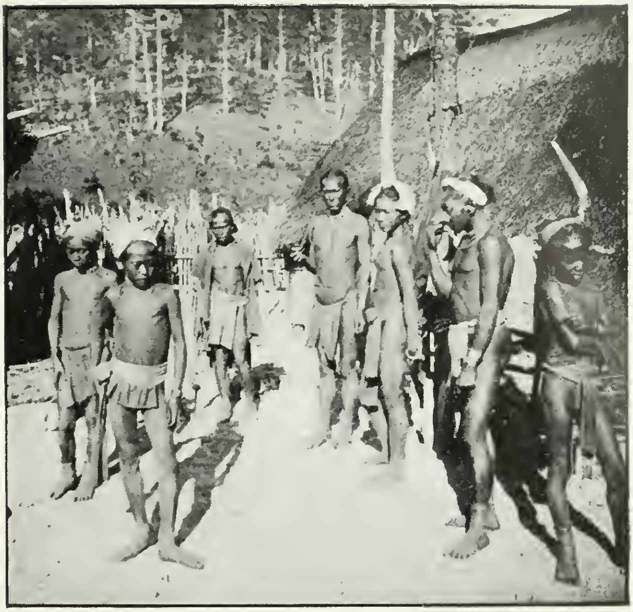


Fig. 7. Annam—A group of Mois on the Langbian Plateau. (By permission of Wm. Heinemann, of London.)

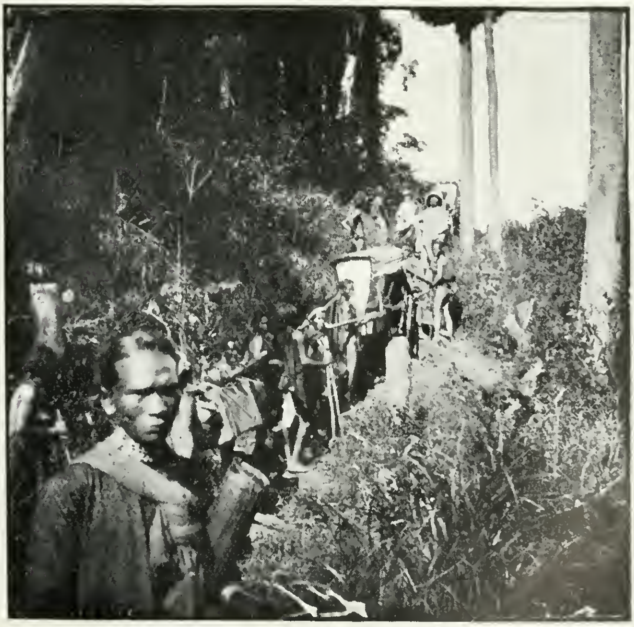


Fig. 8. Annam—On our way to the Langbian Plateau. (By permission of Wm. Heinemann, of London.)

clothes together with a piece of string and hung them from the middle of the roof, but even then I found in the morning that they were not entirely free. The inhabitants of the village, who kept at a distance while we were having dinner, surrounded the hut when we retired for the night, and peeped in through the cracks between the bamboos. They were about four deep round the hut. Those who were near the biggest cracks would no more have thought of giving up their places than a man who has got the front row of the pit! I did not mind when I was once in bed. They stood there chattering all night, and we found them in exactly the same position in the morning.

We had many adventures, and often ran the risk of being left without coolies, because the men of some villages sometimes refused to accompany us. We needed a great many, as we had to take everything with us. It would not have been possible to replace the forgotten candle or tooth-brush.

On approaching the last village where we were to sleep before arriving back in the Plateau, we heard the sounds of music—that is, metal gongs being clashed together. We did not know whether it was a welcome or a warning to keep off. Fortunately, it was the former. The Moi chief advanced towards us, and took us towards his hut. It was a splendidly built hut, on piles, raised about fifteen feet from the ground, and contained some hundred families. First, the Moi chief helped my husband up the wooden plank into the hut, and then his wife came and helped me. The hut was divided into two parts. The first seemed common to all. The second was divided into sort of cubicles. Each family had one. Here we saw the women preparing the rice for her husband and children. With all these fires the atmosphere may be imagined.

After our inspection we returned to the public room, and found that a feast was to be held in our honour. The word "feast" in Moi language is the same as "to drink," and for our benefit the two huge jars of alcohol had been brought out and placed in the middle of the floor. This Moi alcohol, called "ternum," is made from fermented rice. The wealth of a Moi village is always valued by the size of its jars of ternum. All the Mois surrounded the jars, the chief, with a piece of long, thin, flexible bamboo, among them. He put one end of the bamboo in the alcohol, and then squatting down put the other end in his mouth. Suddenly he passed the bamboo on to me.

I could not even wipe the end with my handkerchief with so many Mois eyes upon me, so I boldly put it into my mouth. At first I tasted nothing; then obeying the Mois signs to squat like themselves I had enough of their liquid to last me for the rest of my life. After the bamboo had been passed round several times we asked leave to retire. Our beds had been put up in another hut close by. Although the Mois are peaceable and friendly, they may become dangerous when they are drunk, and by the time the alcohol would be finished the whole hut would be drunk—men, women, and children. All night we heard the voices getting louder and louder, and the laughter more and more boisterous. In the early morning we thought it more prudent to retire as quickly and quietly as possible, though, naturally, we were sorry not to say good-bye to our hospitable host.

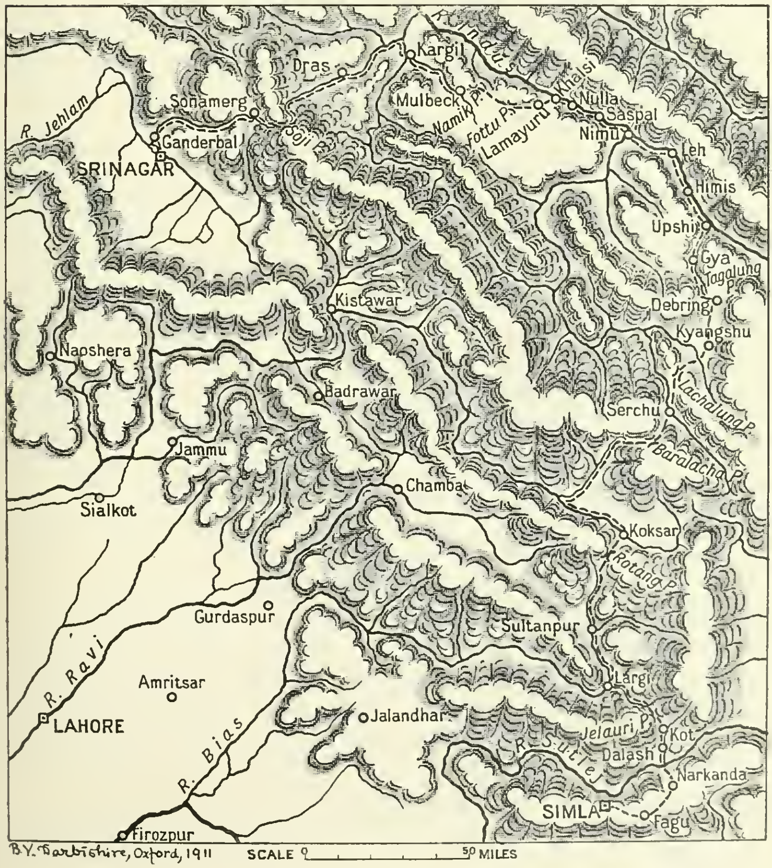
It is sad to think that the Mois are dying out. But that is certainly their fate. Their intertribal wars, as well as the epidemics of cholera and dysentery, which the French have not yet been able to put a stop to, are making terrible ravages among them.

I am sorry I have not had time to tell you anything of the big game in Annam, but I will just mention the elephant which my husband shot three days before leaving Nhatrang, and the tiger which I shot.

SIXTY DAYS MARCHING THROUGH LADAK AND LAHOUL.

By Mrs. Arthur Schuster.

(An Address delivered to the Society in the Geographical Hall, on Tuesday, February 15th, 1910, illustrated by the author's photographs, and a map prepared by Mr. B. V. Darbishire.)



GEOGRAPHY.

LADAK or Western Tibet is bounded on the south by the great Himalayan Range and on the north by the Karakoram mountains. The country is rendered more mountainous by the bifurcation of the Himalayan range at the point where it is intersected by the Sutlej river. The Himalaya splits up into the Zaskar range branching off to the north, and the Pir Panjal to the South; while between the Zaskar and the Karakoram lies the Ladak range, which also belongs to the Himalayan system.

It must be remembered that the Himalaya is not a water parting; the Bramaputra and the Indus both rise behind it, and very near to each other in Chinese Tibet, and after flowing in opposite directions they cross the main range at its eastern and western extremities respectively. In fact all the great rivers flowing south into India cut through the Himalaya; and the Indus crosses the Ladak range no less than 3 times in its course.

GEOLOGY.

The Central Himalayan zone " is composed of granite and other crystalline rocks and a great group of unfossiliferous sediments of an unknown age. The Tibetan zone lying behind the line of the high peaks is composed of a series of highly fossiliferous sediments ranging in age from the Cambrian to the Tertiary period."* There seems little doubt that the highest mountain range in the world is also one of the youngest, and there is no evidence to show that it existed prior to the Eocene period. At the earliest time of which the geologists have any record the Himalayan area formed " part of the floor of the Purana Sea, which stretched over much of what is now the Indian Peninsula."* Subsequently the sea retired to the north and the area on the Indian side of the line of great peaks became the northern coast of Gondwana land. In later times the Indian Peninsula was covered by a sea called by geologists the Tethys, and this advanced northwards and again submerged the Tibetan zone of the Himalayan area. It was only in the Tertiary epoch that mountain building commenced and the Himalaya and Tibet finally emerged and the Tethys disappeared. This was followed by volcanic activity in the Eocene period.

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* Sketch of the Geography and Geology of the Himalaya Mountains and Tibet, Part IV., by Col. S. G. Burrard, R.E., F.R.S. and H. H. Hayden, B.A., F.G.S.

"The Himalayan region is strikingly poor in minerals of economic value." † Gold in small quantities is found in the gravels of the rivers, and the goldfields of Rudok and Thok Jålung were worked from early antiquity, which probably gave rise to Herodotus' well known reference to the gold-digging ants. At present the only mineral exports that are of any importance are salt and slate from the Kangra district; the sapphire mines in Kashmir having been closed by the Maharajah some years ago.

INHABITANTS.

The first known inhabitants of Tibet were the Mons who had their most important settlement in Zaskar. Their descendants are still found in some of the villages. The country became at an early period of its history a camping ground for Tibetan nomads; and was also entered from the west by the Dards from Gilgit, who spread over a great part of Ladak and still form the basis of the population in the districts round Kargil and Dras, where the Dard language is spoken at the present day. The Dards were an athletic race, and it is to them that polo owes its origin. It is still played by the natives especially in the Gilgit neighbourhood, and matches are arranged between the villages there in the same way as with cricket or football in England. The Dards also introduced irrigation into the arid mountain regions of Ladak; and they engineered the long horizontal watercourses cut in the mountain sides to carry the water from some steep gully to the more open valleys, where agriculture is possible. They also left a number of rock carvings in various parts of the country.

RELIGION.

About the time of the commencement of the Christian era Buddhism was introduced into Ladak from India and Kashmir by the Mons, and from Gilgit by the Dards. The ancient religion of the Tibetans was Bon chos, which divided the universe into three realms represented by three colours: white for heaven or the land of the gods, red for earth or the land of men, blue for the lower world inhabited by water spirits. The tree of the world grew up through these three realms. The Bon chos religion flourishing in close contact with Buddhism adopted some of the system of the latter and founded Bonpo monasteries of which Lamayuru was one. On the other hand as Buddhism gained in power it also adopted many of the Bon chos ideas, so that the two religions became to a certain extent merged in the present degenerate Buddhism of the Lamas.

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† *Ibid.*

HISTORY.

Buddhism was not firmly established in Western Tibet till 900 A.D., when the rule of independent chieftains was superseded by a dynasty of kings which branched off from the Central Tibetan Dynasty. The end of true Buddhism was brought about in the 14th century when the novices instead of being trained in the monasteries of the western kingdom were first sent to Lhasa. From that time the religion became more and more saturated with superstition under the bad influence of the central body of monks in the Lhasa monasteries. The centralisation of the education of the Lamas also had the unfortunate effect of killing the national literature of Ladak which up till that time had flourished chiefly in the local monasteries.

A second dynasty succeeded to the throne in 1470 and continued in power until the Dogras of Jammu invaded the country in 1834. The Jammu rajahs who had also annexed Kashmir, united Ladak to that country in 1846, and since that date the whole of Western Tibet has been under their rule. A descendant of the ancient kings of Ladak still exists however, and is allowed to collect the tribute of one village in the neighbourhood of Leh, the capital of the country.

ROUTE.

The route from Kashmir to Leh goes through the beautiful Sind valley to Sonnamerg, and gradually rises to the foot of the Soji La (pass) which crosses the main Himalayan range at the comparatively low altitude of 11,300 ft. The Soji La forms the boundary between Kashmir proper and the tributary country of Ladak.

The road ascends very steeply on the Kashmir side of the pass, and after passing the summit proceeds through an almost level valley in which edelweiss is seen growing as thickly as grass. The Tibetan plateau is nowhere lower than 9,000 ft., so that the descent from the Soji La on that side is slight and also very gradual.

The monsoon is not supposed to cross the Himalaya and therefore there is a great change in the appearance of the country as soon as Ladak is entered. The mountain sides are no longer clothed with forests, and the valleys with pasture and crops as in Kashmir, but the former are bare and rocky, and the latter contain little but stones and sand, except where there has been careful irrigation. As the amount of level ground is very small, it is customary to build the villages among the rocks on the mountain sides, the houses rising like steps one above the other, so that the road to one habitation is often over the flat roof of the one beneath (Fig. 3). By this method all the land sufficiently flat to cultivate is reserved for growing food stuffs for the inhabitants of the villages. The barren nature of the country has naturally very much restricted the population, and the custom of polyandry, which prevails throughout Ladak, is doubtless the product of an environment unsuited to support large families.

The first place of interest after crossing the Soji La is Dras, where there is an old Dogra fort (Fig. 1) and also some interesting carved stone figures, which are probably examples of the introduction of Buddhist art from Kashmir in the 1st or 2nd century B.C. Kargil boasts another Dogra fort and is situated in one of the largest and most fertile valleys on the route. A small kind of apricot grows in great quantities near the banks of the river flowing through this valley, and forms a very pleasant addition to the traveller's bill of fare, as it can not only be obtained on the spot when ripe, but in the dried form is easily stored for subsequent use.

At Mulbe the first Lama monasteries are met with—one perched, as is customary, on the top of an almost inaccessible rock. By the side of the road just outside the village is a very fine carving in high relief on a granite boulder (Fig. 2). The figure, which is from 15 to 20 ft. in height, represents Maitreya, or the future Buddha of the next Kalpa (cycle of 100,000 years). This carving, which is probably 2,000 years old, is in a very fine state of preservation.

The most interesting place on the route is Lamayuru which, as already mentioned, was the ancient stronghold of the Bon religion (Fig. 4). This large lamasery is built on a group of natural rock and sand pillars formed by erosion and dominates the valley below. The name Lamayuru is derived from Yung Drung, the Tibetan for Swastica, that prehistoric worldwide symbol of obscure meaning. At Lamayuru the traveller will see a large number of Mani walls and Chortens which need a word of explanation.

The Mani wall is composed of stones on each of which is carved the invocation to Buddha "Om Mani Padmi Hum," which may be translated: Hail to the one born of the Lotus. The erection of such a wall, or even the contribution of a carved stone, counts as a good action, or "makes merit" either for the donor himself, or in some cases for the soul of a deceased relative.

The first Mani walls are traced to the reign Sennge Namgyal (1590—1620), but the longest was built by his son Deldan Namgyal (1620—1640) for the spiritual welfare of his mother. It is near Leh and is 850 paces, or over half a mile, in length (Fig. 5). The same king also erected the largest Chorten for the benefit of his father's soul.

A Chorten is a square or circular monument with a small spire usually finished off by the familiar oriental emblem of a representation of sun, moon and star, by a crescent on which rests a disk surmounted by a small diamond-shaped block (Fig. 3). The Chorten contains a small hollow chamber usually open on one side, and in this are placed the ashes of dead Lamas. These ashes are compressed with a little clay into a mould and are generally known as "potted Lamas." There are several different types of Chorten, and they are found at either end of most mani walls, and in large numbers in the neighbourhood of Lama monastic establishments.

After leaving Lamayuru the traveller descends a narrow gorge which leads out into the Indus valley. This gorge is full of pillars of a conglomerate of sand and stones, and other curious results of erosion. For a considerable distance the road is cut in the mountain side, which rises and falls precipitously above and below it (Fig. 6). The Indus at the point where the tributary stream joins it, flows through a barren stony valley about a mile wide, and a couple of miles further up is crossed by the interesting Kalatze Bridge (Fig. 7).

A bridge was first constructed on this spot by King Naglug between 1150 and 1175, and on the northern bank of the river stood a custom house, whose officer held the title of "Lord of the Trade in the Lower Valley." Beads have been found on

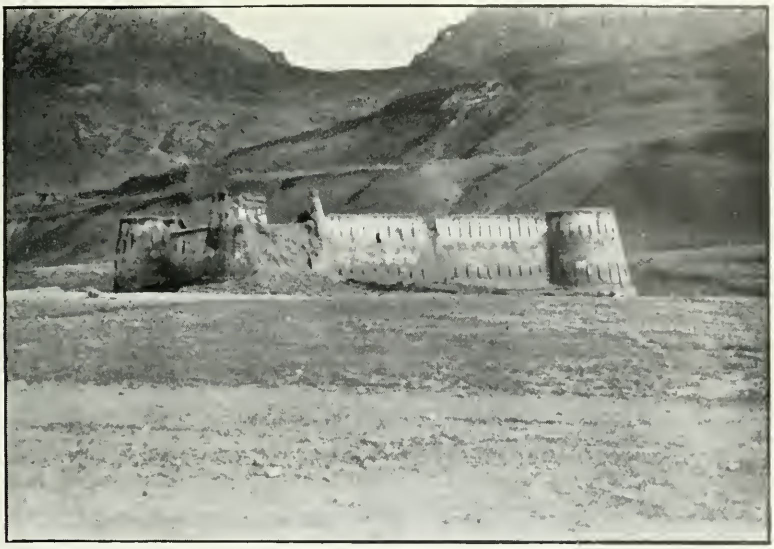

Fig. 1. Dogra Fort at Dras.

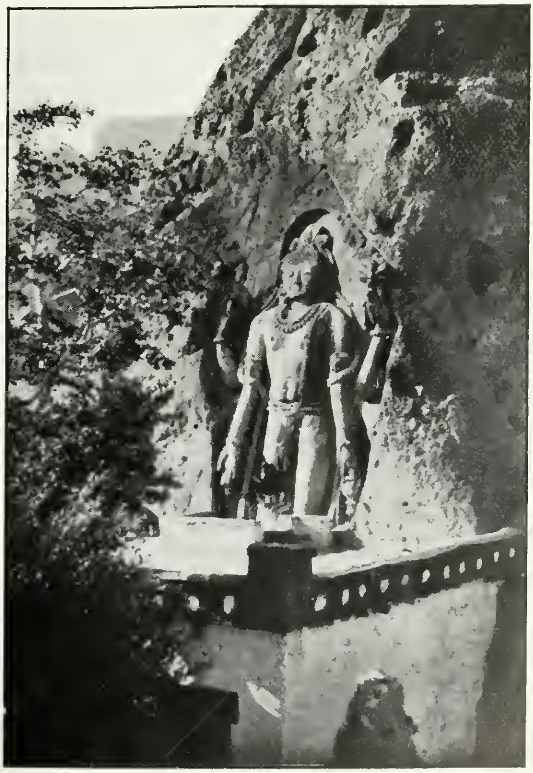

Fig. 2. Maitreya at Mulbe.

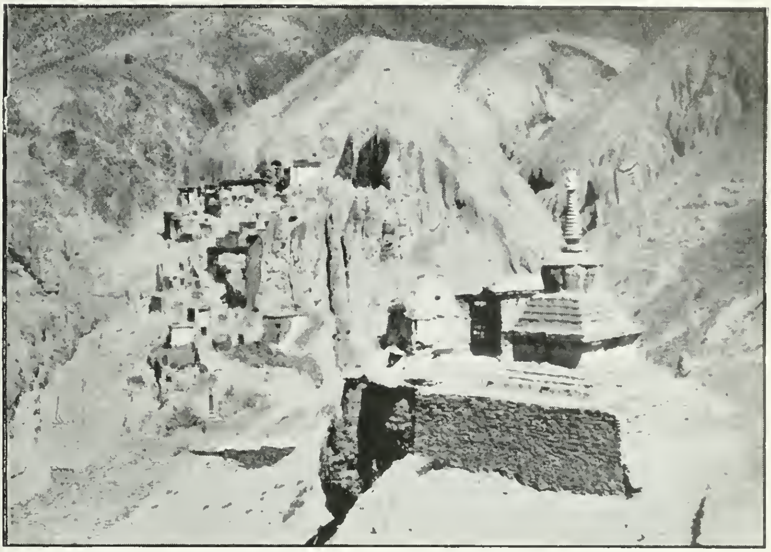

Fig. 3. Village in Rocks and Chorten, Lamayuru.

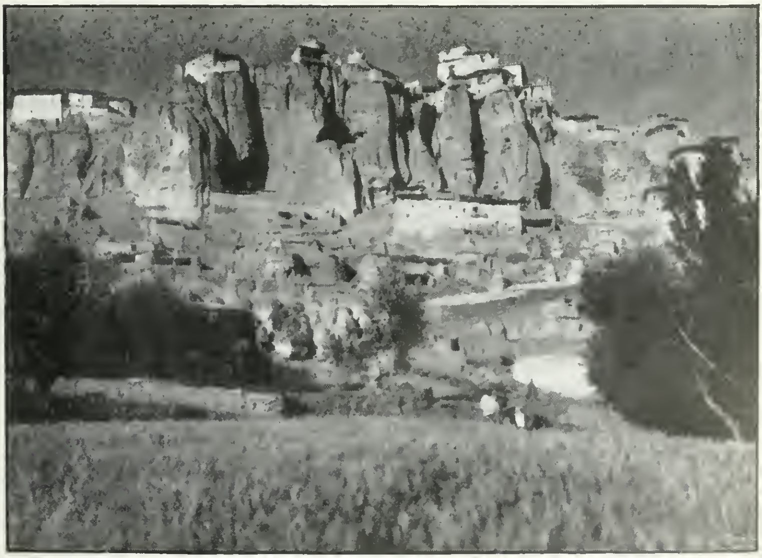

Fig. 4. Lamayuru Lama Monastery.

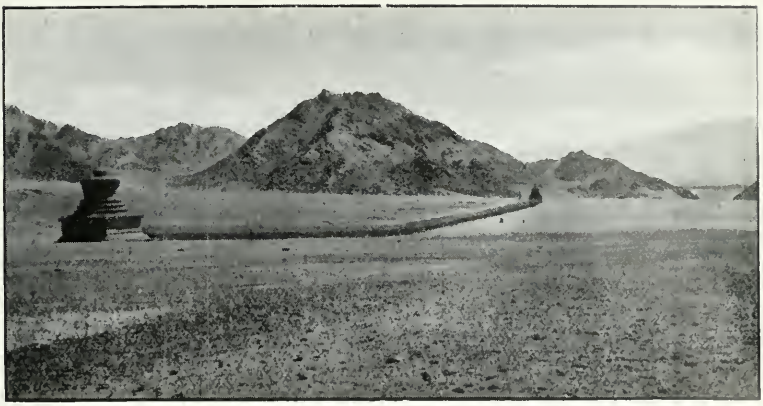

Fig. 5. Deldan Namgyal's Mani Wall, Leh.

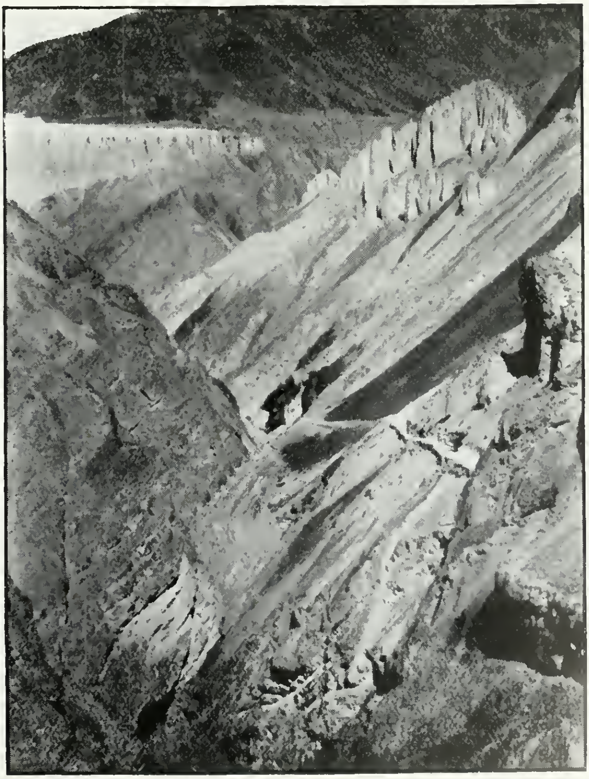

Fig. 6. Road from Lamayuru to Indus Valley.

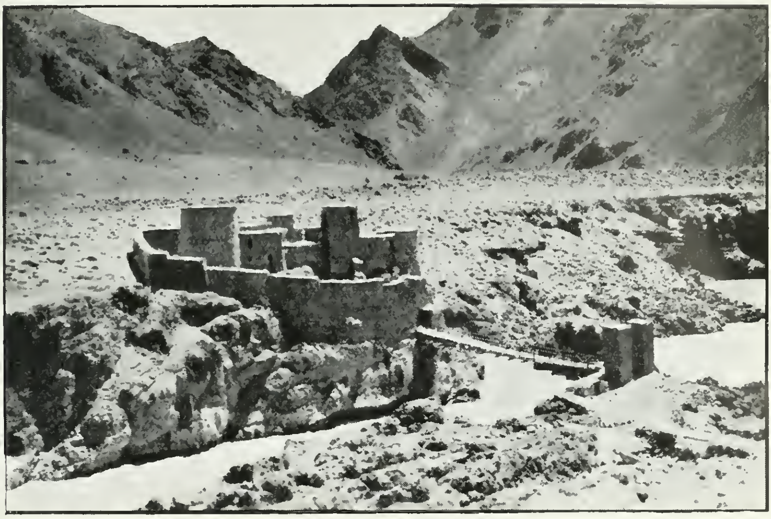

Fig. 7. Kalatze Fort and Bridge over Indus.

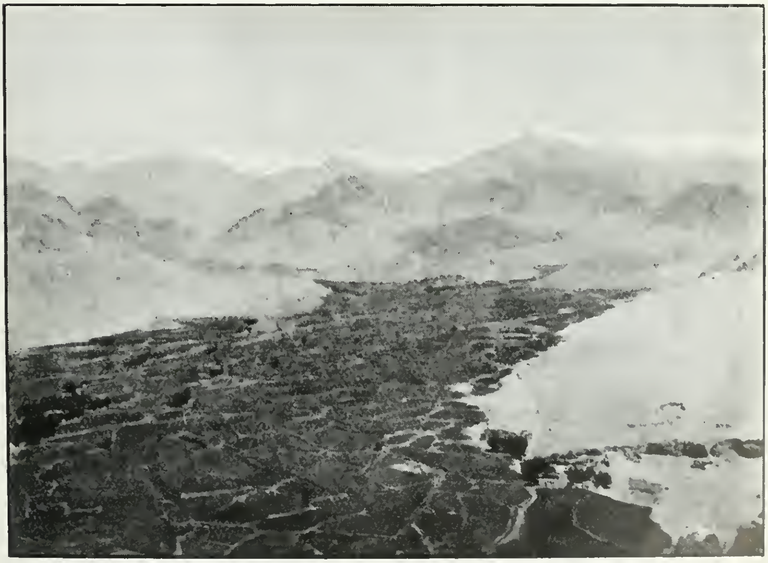

Fig. 8. Irrigated Fields in Leh Valley.

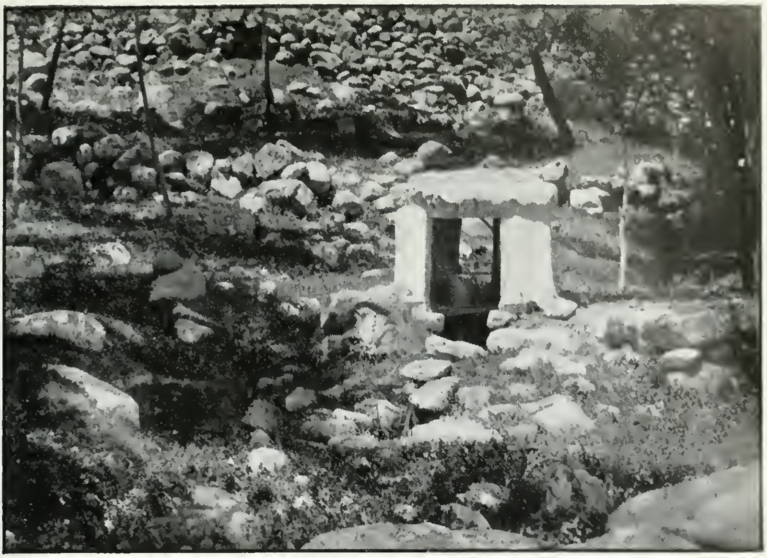

Fig. 9. Prayer wheel worked by stream at Leh.

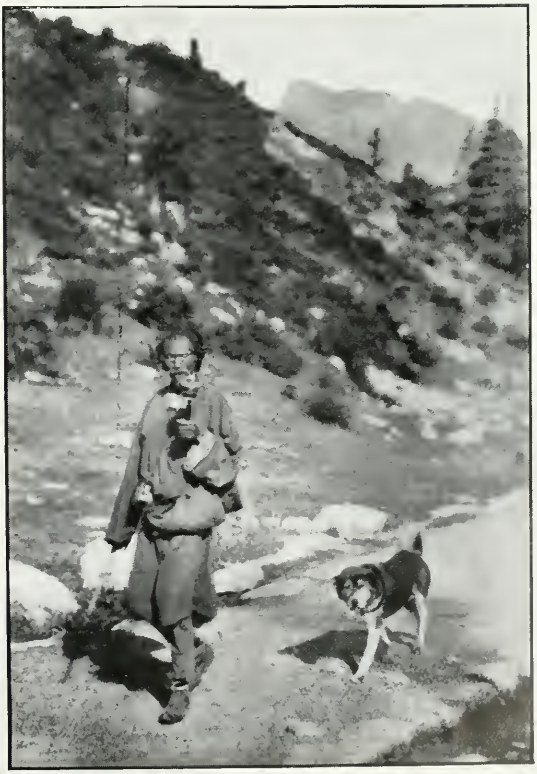

Fig. 10. Wandering Lama turning Prayer wheel.

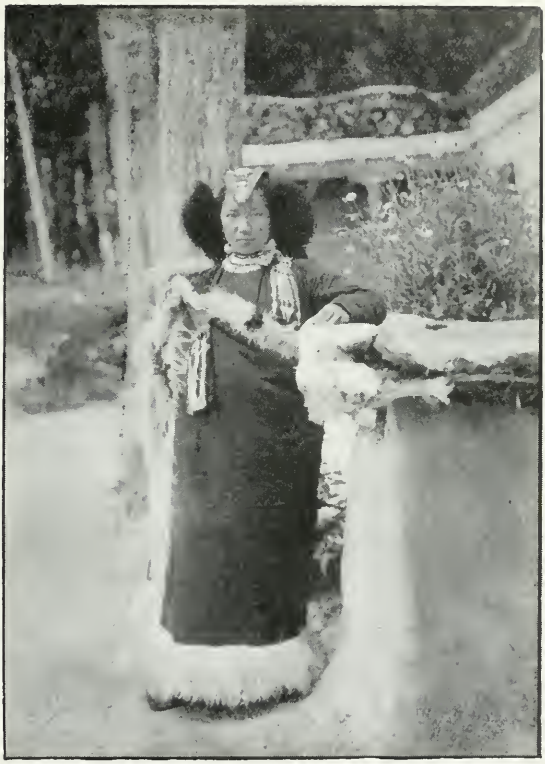

Fig. 11. Ladaki woman.

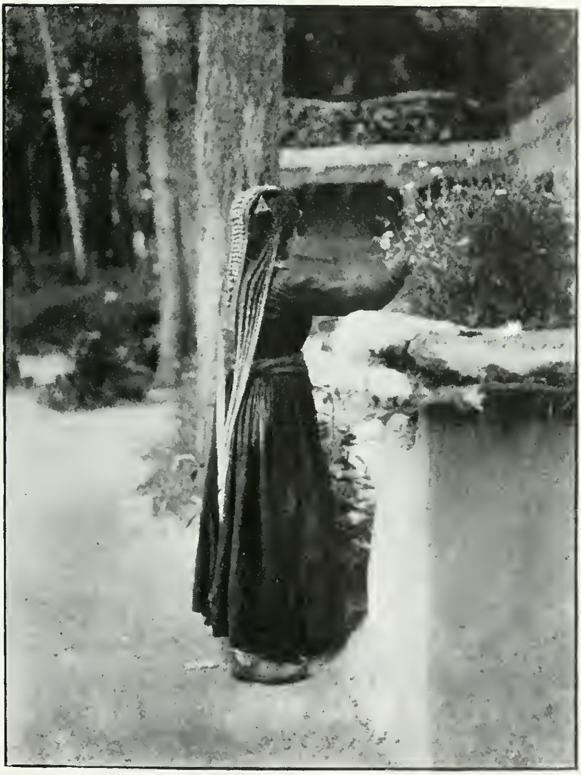

Fig. 12. Beyrak as seen from behind.

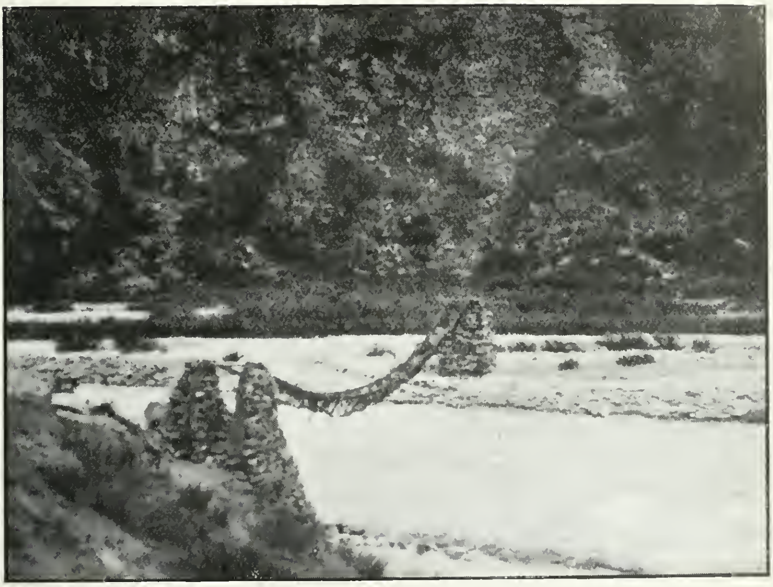

Fig. 13. Jula Bridge in Lahoul.

this site but no coins, and it seems probable that duties were levied in kind and not in money. A fort now stands on the foundations of the old custom house and has been the scene of a great deal of fighting in the various wars in Ladak.

From this point onwards the course of the Indus is followed from one village to another, though the river itself often flows through gorges too narrow to admit of a road, and the latter has therefore to be taken across mountain ridges, which divide the side valleys draining into the river.

As far as Leh travellers' bungalows are kept up at each stage by the Kashmir government, for the use of which a small charge is made; the attendant being obliged to provide a supply of firewood and water for the visitors. The accommodation is rather rough and the furniture meagre, but as most people travel in these regions with a complete camp outfit, it is quite possible to make oneself fairly comfortable for the night.

Leh is situated 11,500 ft. above the sea level, and four miles from the Indus, being separated from the river by a stretch of sandy desert. The city is at the foot of a mountain spur rising abruptly from the plain. On this ridge stands the palace built by Sengge Namgyal and also several monasteries—one near the top containing a gigantic figure of Buddha 58 ft. high. Leh is an important trade centre, with a number of resident merchants besides the traders of various nationalities who are constantly passing through with their caravans. Roads lead from Leh into Russian and Chinese Turkestan and into Chinese Tibet, as well as into India, Kashmir and Afghanistan. The views from the palace are very fine, including the snow mountains of Zaskar across the Indus to the south, and the snow passes leading to the Karakoram mountains to the north. The city itself is well supplied with trees, chiefly poplars, and behind it, in the amphitheatre formed by the mountains, the ground has been well irrigated and is covered with crops (Fig. 8). One of the most interesting sights of Leh is the prayer wheel worked by water power (Fig. 9). A small stream falling on a rudimentary turbine rotates the wheel, which has much the shape of a churn. Each prayer wheel contains a roll of paper on which is inscribed the invocation to Buddha already referred to, and when the wheel is turned it "makes merit," in this case for the one who erected it (Fig. 10).

The dress of the native Ladaki woman is very picturesque, and is chiefly distinguished by the curious headdress called the

Beyrak. This consists of a long strip of cloth about 4 or 5 inches wide which is set with large turquoises and gold ornaments. A point is formed over the forehead and the Beyrak hangs down about 2 ft. at the back over the hair, which is plaited in a dozen or more small pigtails eked out with braid and gathered into a tassel near the hem of the skirt. On each side of the face are sort of blinkers formed of curly black sheep or goat's wool attached to the wearer's own hair (Figs. 11 & 12). No Ladaki woman considers it decent to appear in public without her Beyrak, and all her savings are invested in turquoises and ornaments to attach to it; so that many women are carrying about £60 or £70 worth of stones and gold on their heads while working in the fields. They also wear handsome gold and silver necklaces, ear-rings, charm boxes, etc.

Our caravan on leaving Leh consisted of 12 baggage ponies, and riding ponies for Dr. Schuster and myself and our two Indian servants, besides two Kashmiris and Tibetan coolies to look after the animals.

The famous ancient monastery of Himis, 24 miles further up the Indus than Leh, is situated at the top of a steep ravine about three or four miles from the river. Unfortunately this lamasery has been denuded of most of its valuable images, carvings, brasswork, etc., through the dishonest dealings of its chief steward. Some of the courtyards are lined with prayer wheels set in niches of the walls, to which the devout may give a turn as they pass by; but many of these are missing and have no doubt passed for a consideration into the hands of travellers visiting Himis.

About 40 miles from Leh the traveller leaves the Indus and strikes south through a side valley which gradually rises to the foot of the Tagalung Pass (17,500 ft.). The last village is left behind several miles before the pass is reached, and the traveller has before him the prospect of passing nearly a fortnight out of sight of either a house or a tree. From the summit of the Tagalung the road descends on to the Kyangshu plain which is nowhere less than 15,000 ft. high. This is the home of the species of zebra called Kyang which roam about in herds, and there are also wolves and a great number of marmots. The Yak, which were originally wild here, have been domesticated by the nomad tribes who wander about this high plateau, camping in some side valley where they can find sufficient pasture to feed their flocks and herds. Vegetation is exceedingly meagre, and consists of little more than a few herbs growing among the stones and rocks on the mountain sides, or a narrow margin of grass along the edge of the streams formed by snow melting on the higher peaks. These streams soon lose themselves in the sand when they reach the plain, most of which is altogether devoid of vegetation, or only covered with tufts of scrub.

The Tibetan nomads from time to time descend into the Indus valley to sell wool and obtain grain for food; but they consider the lower altitudes of 10,000 or 11,000 ft. very relaxing and unhealthy, and strongly object to leaving their natural habitat more often than necessary. When reaching the Kyangshu plain the transport ponies are sent back to the last village, and in their place yak are hired from the first nomad tribe met with. It was, however, with considerable difficulty that ponies for riding were obtained to take the caravan on until the first village in Lahoul should be reached. A small flock of goats for milking, and a few sheep to provide mutton when required, were also taken on for this part of the journey. Flocks of goats carrying small saddle bags filled with borax or salt, which are both found on the Tibetan plateau, are frequently met with on their way down to places where these commodities can be sold. The Lachalung Pass (16,630 ft.) is traversed on leaving the Kyangshu plain and leads into valleys drained by the Zaskar river. The next pass is the Baralacha, and here the main Himalayan range is recrossed at a height of 16,047 ft. The Baralacha forms the boundary between the territory of the Maharajah of Kashmir and Lahoul, which is directly under British rule. Very fine views of snow mountains of from 20,000 to 24,000 ft. in height are obtained in descending from this pass. After passing through a region where no trees grow, and the largest plant is a scrubby brushwood not more than 18 inches in height, Lahoul strikes one as comparatively fertile; though it would probably produce a very different impression if entered from the south. As a matter of fact most of the vegetation is due to artificial irrigation, and in this respect the Lahoulis owe a great deal to the German Moravian missionaries who settled down amongst them 40 or 50 years ago. Under their tutelage the inhabitants have become fairly prosperous and are no longer half starved and dressed in rags. Mention must not be omitted of one interesting feature of Lahoul, namely, the Jula Bridge (Fig. 13). This bridge is formed of three ropes of plaited birch twigs, one for the feet and two for the hands on either side of it, which are connected with the central rope by strings of twigs. The bridge is suspended at either end from a small platform, ascended by a few steps. To cross a rapid river by such an unstable contrivance is apt to render the steadiest head dizzy; but there are comparatively few places now, where the Jula bridge has not been superseded by a more solid structure.

From the first village in Lahoul to Kyelang, its principal place, the road passes through a narrow valley flanked by mountains from which fine glaciers overhang and drain into the Bhaga river. Lahoul is divided from Kulu by the Rohtang Pass over the Pir Panjal range, which forms the water parting between the Chenab and Beas rivers. The Rohtang Pass (13,048 ft.) descends steeply into the beautiful and fertile Kulu valley. The mountain sides are clothed with pine trees, and when the valley itself is reached trees of all sorts, shrubs and flowers and ferns are seen flourishing luxuriantly. The fruit grown in the Kulu valley is of noted excellence, and consists chiefly of apples and pears which are exported to various parts of the tropics. Kulu is left by the Jelauri Pass (10,720 ft.) which divides it from the valley of the Sutlej, the last river the traveller crosses before ascending to Simla.

The distance from Srinagur in Kashmir to Simla by the route described is 596 miles, and the time occupied by the journey 62 days. Twenty days were spent in actual marches between Srinagur and Leh, and 30 between Leh and Simla. The average marches were about 15 miles in length, but in some cases over 20 miles were covered, while in others it was more convenient to make a short day of only 8 miles. The length of the march was chiefly governed by the position of the travellers' bungalows, or, where tents were being used, by the places where camping ground, drinking water, fuel, and fodder for the transport could best be obtained. The start from Srinagur was made at the end of July, and it may be noted for the benefit of intending travellers that the passes into Ladak are rarely open before May and close in December while Lahoul is quite cut off on the Indian side for about 7 months of the year.

The weather all through the journey was extremely unsettled, there being seldom more than three consecutive fine days. A great many storms of rain and hail and even some snow were experienced, all of which was quite contrary to the expectations formed from the meteorological records. In Leh itself where the annual rainfall averages three inches, one inch fell during the week spent there. In spite of this the air was always extraordinarily dry. Although one associates blazing hot suns and cloudless skies with the plateau of Tibet, cloudy skies were far from uncommon, and it was rarely that a clear distant view was obtained from the highest points reached. These meteorological conditions were probably the result of the exceptionally heavy monsoon rains in India in the year 1908, in which this journey was undertaken.

"THE FASCINATION OF GEOGRAPHY."

By Miss Kate Qualtrough.

(Addressed to the Society in the Geographical Hall, on Tuesday, February 8th, 1910.)

Having met people who expressed surprise at anyone even liking Geography, which was described as dry, dull, and uninteresting, it occurred to me to analyse the factors, which, in my opinion, make it such an interesting study.

Geography is concerned with the earth's surface, the condition of its various parts and their relation to each other, and the influence of those conditions and relations on plant, animal, and especially human life.

We live in a beautiful and interesting world, one marvellously fitted to supply our wants and to provide us with enjoyment, and it seems fitting that if we would be worthy denizens of such a home that we should know something of it, what it looks like, how large it is, what resources it contains, and what sort of lives are lived in it. To know these things is the main purpose of Geography—to have certain facts known because when learned, they have a value of their own.

It is the study which brings the imagination into play in order that mental pictures of things wholly outside the range of one's own observation may be formed, and therefore, it is full of natural attraction.

The process of discovery which has revealed nearly the entire surface of the globe, the varying conditions of climate, the distribution of races and nationalities, the products, organic and inorganic, of land and sea: these stimulate the curiosity, retain the attention, and enlarge the mental horizon.

Geography is connected intimately with other studies. Being concerned with local conditions, it touches upon the study of common things. The size of countries and the distance from place to place, bring it into contact with *arithmetic*, and it is impossible to study the *history* of any race or nation, however isolated, without reference to the configuration of the Country, the conditions of soil and climate and the contiguity and remoteness of other peoples. The more formal study of history requires constant reference to a map, and it is possible to study the detailed history and geography of the same region concurrently and to some extent in connection. But the influence of geographical conditions in history is more clearly evident in the great movements of world history, and it may properly include some rapid surveys of the general march of civilisation westward from the most ancient times; of the great migration of races, and of the rise of modern nations.

In order that Geography may be of real educational value, it must not be regarded as a process by which certain facts about the earth or the portion upon which we live, are committed to memory but as the subject, which above all others, brings the youngest as well as the most advanced student into contact with the outside world, the world of nature as distinct from the world of books.

It is true that as one acquires more knowledge, reliance has to be placed to a great extent upon the investigations of others, but to understand these, individual work is required, and the taking of nothing for granted. This is not difficult, for wherever one's home is, there lie all the materials needed for the study of the whole globe. The earth indeed has been compared with a great library where no manuscripts have perished but all exist as legible and as accessible as ever.

The three divisions of Geography: Physical, Political, and Mathematical, cannot be treated as three distinct branches, because of their close connection, especially Physical and Political, as the latter can always be accounted for from a study of the first.

The earth is wonderfully designed for human habitation, being our granary, our vineyard, and our lordly pleasure house. In some parts nature is bountiful, in others penurious. Over some, she sheds beauty; in others, she offers material prosperity; at one place, she hides treasure; at another, it is spread on the surface. Sometimes neighbouring peoples are invited to intercourse, at other times impenetrable barriers are erected between them. In some regions, the inhabitants are lured to peaceful prosaic industry, in others they are terrified by displays of awful and inexplicable forces. And even of those regions which she seems not to have designed for our use, the torrid desert, the lonely rocky mountain, and the mysterious ice-bound regions, may it not be said truly, that they too are part of the bounteous provision made for our many sided wants, because they impress and exalt our imagination, minister to our sense of beauty and yet humble our pride, making us feel that there is something more in the world than is immediately and easily intelligible to us, giving in short, a sense of the mystery, the vastness and the sumptuousness of the world, very necessary for a right estimate of one's own true place in it ?

And with such considerations as these, one sees how curiously the mere physical conditions in which man is placed determine his habits, the life he leads, the kind of societies he forms, the character and history of different races. Think of our own fair island, this precious stone set in the silver sea, if we turn the globe into the position in which England is at the top and in the centre, we notice how advantageously she is placed in the middle of the hemisphere of land, near enough to partake of all the advantages of Western Europe, but far enough off to encourage in her people the spirit of independence. With her extensive coast, her excellent harbours, her hardy yet temperate climate, one that allows men to work with less interruption and on a greater number of days than in any other country of the world and the thought of our insular position, our climate and resources cannot be dissociated from the character and history of our people.

Holland is a striking example. It is low, flat, moist, hence suited for pasture rather than tillage, favourable for the rearing of cattle and dairy farming, and the land is so low that the encroachments of the sea can only be prevented by enormous and costly dykes and by incessant watchfulness. Therefore its inhabitants are distinguished by foresight, endurance, thrift and industry. The scenery being flat, dull, and uninspiring they are distinguished neither by the wealth of their imagination nor by the splendour of their literature.

The vast alluvial plains, watered by the Nile, the Euphrates, the Indus and the Yellow River, provide another example, The soil is rich, the wants of the people few, the inducement to exertion small, and here have been found in all ages a teeming population, agricultural and stationary, attached to the soil, conservative in habits of thought, easily subjugated and kept in subjection and consequently here have been appropriately placed the great despotic monarchies.

On the other hand, small maritime states like ancient Phœnicia, Greece and Italy separated by ranges of hills, inhabited by little communities, isolated, yet compelled sometimes to fight for their liberty, jealous of each other and therefore self asserting, their history is full of records of internal divisions and an heroic struggle for liberty. The connection between the free vigorous life of early Rome and of the Etruscan and Greek Republics and the physical conditions under which the people lived cannot fail to be seen.

Or contrast, with the great communities which have been formed, the Egyptian, the Assyrian and the Chinese Empires, the state of the people on the Great Tartar Plain, where herbage is scanty, and a settled habitation is almost impossible, and where nomadic, restless, wild, suspicious and warlike races find an appropriate home.

In the same manner the influence of climate may be traced in some countries by the way it enervates the labourer and in others by the way it impels him to exertion and calls out his higher qualities. It may even be seen how the aspects of nature affect the National character, for where physical phenomena are equable and uniform as in temperate climates and man has learned how to control nature, a resolute, self-reliant people are found, proud of their strength and encouraged to use it. But in regions subject to frequent earthquakes and convulsions, where the aspects of nature are formidable and its phenomena on too vast a scale to be subject to human control, *there* are found a timorous, superstitious people without enterprise or any of that cheerful hope which animates intrepid discoveries and great inventions.

Physical geography is therefore the basis of all true geographical teaching. Here as in other subjects, it is not only details that are of value, but also the tie that binds them together, and all mere topography, all political administration and commercial geography must ultimately be connected with a right understanding of such matters as soil, climate, shape, size, geology and natural resources.

In early life, the imagination is awakened and stimulated by stories told to the young of the world they live in, and they prove eager listeners to the Myths of the Ancient Greeks, stories of the Goddess of the Dawn driving in her chariot to herald the opening day, or of the "Grey sisters in the Frozen North" who turned into icebergs.

Tales about the old Vikings or Argonauts of legend will prepare them for the voyages of real explorers like Columbus, Sir Francis Drake, Cook, Scott, Nansen, and Shackleton. Stories too in a geographical setting with illustrations about Red Indians and their wigwams, Eskimos and their snowhuts, Arabs and their desert homes awaken interest in foreign countries; and nature lessons adapted to the different times of the year form a prelude to "the Seasons" and their characteristics; being a skilful introduction to this study, with an eye to the future when the definite by a natural process grows out of the indefinite, and coherence and system are given to what must be at the first fragmentary and unsystematic.

It is essential from the commencement of formal study to consider what knowledge can reasonably be expected at the end of four or five years, and it will probably be not too ambitious a scheme for an English child to be acquainted in a very general way with the chief features of the great divisions of the world, the geography of Great Britain and the British Isles, the countries of Europe and lastly Greater Britain beyond the seas.

This order will not be preserved in text books and there is no subject in which it is more necessary to emancipate oneself from their domination than this. For in reading and writing there is a sequence of difficulty, in grammar and arithmetic a philosophical sequence, and in history the sequence of chronology; but in geography there is no sequence at all, for except by accident or association no one topographical fact is more important than another, or can claim to be learned earlier. To every man his own home and his own work make the centre of the world and the value for him of all information about the rest of the world is entirely relative. Text books cannot recognise this and are bound to give in equal detail facts, some of which from this point of view are important and some unimportant, instead of the order of importance and of usefulness in which facts are related and thus to the order in which they should be learned. The question arises, what are the facts which it behoves a well instructed and intelligent person to know? A great many names and statistics are learnt which no educated person is expected to know or would care to remember, and there would not be so great a lack of knowledge of which the need is felt when mixing with other people or reading a piece of contemporary history, if more thought were given to the occasions on which geographical knowledge is wanted and the uses to which it has to be applied. It is best to begin with what is known and near, letting the knowledge radiate from that as a centre until it comprehends that which is larger and more remote.

Home surroundings require to be properly localised and shown in relation to the size and form of the world itself. The variation in the shadow cast by the sun upon some well known building at different times of the day is observed, resulting in the cardinal points being learned by actual observation and a fixed standard obtained by which to arrange objects near, naturally accustoming the mind to think of remote places as, N. S. E. W.

The method by which direction is found by mariners when neither sun nor stars are visible, thus introducing the Mariners' Compass, and the wonderful fact of the tendency of the magnetic needle to point one way, a fact wholly unique in the whole range of physical science, in itself inexplicable and at the same time most curiously adapted to solve one practical problem in navigation. Distance by actual measurement being ascertained by the rough and ready method of stepping followed by the measurement of time by calculating how long it takes to walk the distance stepped, then putting it on paper, a joint of a finger representing a step and drawing to scale, the way maps are drawn is introduced. The meaning of a plan and a map are mastered, the home put into one, that of Manchester, followed by a map of the district and lastly a map beyond the environment. This being done some general notions of the shape of the earth, the distribution of land and water and the meaning of the simplest geographical definitions are proceeded with by the help of a globe, pictures and models, the latter if possible self-constructed. It is an acknowledged mistake to have these definitions learnt by heart, for though it may be possible to learn in this way, the meaning of isthmus and promontory, the things themselves that are symbolised by the words are usually outside the experiences of the learner and cannot be understood. The point to remember being, it is desirable not so much to represent the thing for which a name is used as to indicate the essential quality which gives it importance enough to *deserve* a name.

As most homes are within reach of a public park, such common things as a pond, a hillock, and a clump of trees will serve to define ideas of what is meant by the lake, the mountain, and the forest. The finest idea of a watershed is the roof of a house; and the slope of a town street after a rainy day affords an excellent illustration of one of the great forces of nature. These elementary notions are interestingly connected with story-telling, drawing and the Science of Common Things.

For example, in the consideration of heat, its source, the substances sending it forth, the effects causing the expansion of both solids and liquids, and causing liquids to become vapour as shown by heating water. The reason for not filling a kettle with water when putting it on the fire to boil is seen, and some idea of a steam engine is gained by observing the water boiling, and an interesting finale is the life of George Stephenson, and his work. Similarly snow is connected with a Polar Expedition and the life of an explorer, and plastic substances with the manufacture of pottery and the life of Josiah Wedgewood.

The recognition of the definitions on a map is the next step, for choice, one of England; and reliance is not to be placed on maps with names printed on them, as the habit of looking for a place thereon means merely looking for a certain printed word, but outline maps on a large scale are a valuable aid to learning. But knowledge of mere names and positions of places is worth little or nothing unless one has some interesting association with them as the memory refuses and rightly refuses to retain mere names because they have no organic connection with anything else one knows or wishes to know. Some idea of topography is gained incidentally in connection with reading, with history and with familiar objects, with the tracing of imaginary voyages and travels; and the map is an absolute necessity when referred to for identifying places of which something more than the geographical position is being learned, indeed every time it is used in such a way something is done to impress geographical facts on the eye, itself a useful lesson.

Thus the study of one's native land does not begin with a bare enumeration of unconnected facts, such as a list of capes and bays and the names of mountains with their exact heights, but with the physical features—the great natural features as determined by the relief of the land (the Lake District, Wales, the Peninsula of Devon and Cornwall, &c.) and their influence upon the natural resources; the study of these throws incidentally much light upon the history of the country, because the introduction of particular trades, inventions and discoveries have in all cases an historical side and form an important element in the history of civilisation. Geography and history are thus inseparably interwoven, neither being fully comprehensible without the other, and topographical names are capable of furnishing information regarding:—

1. Geological changes that have been witnessed by man but of which no historical record may have been preserved; 2. Former aspects of a country; 3. Events and personages mentioned in history. Thus: The former existence of lakes, marshes, and mosses is indicated by names in which the words mere, loch, moor, moss, bog, &c., occur.

No impressions of the past are so abiding or so self evident as those which names preserve, and the names of the physical features:—the Pens and Bens and the Avons, are the relics of our Celtic forefathers, and the rolling wave of Roman conquest has its track well preserved by local names, in the casters, chesters, cesters, and streets that remain in the current speech of the people even up to the line of the Roman wall. Of all the thousands of Englishmen who are aware that Angles and Saxons established themselves in the land, and that they are in the main, descended from them, how many realise that England means Angle-land, or that in the names Essex, Sussex, and Middlesex, is preserved a record of East Saxons, South Saxons, and Middle Saxons, who occupied these several portions of the land. Norfolk and Suffolk are two broad divisions of the Northern and Southern divisions, into which the East Anglian Kingdom was divided. Cornwall hands down the recollection of the Welsh cut off from their British compatriots in the horn or promontory of Devon and Cornwall. The Danes too have left their mark on the land, and limits of their settlements may even now be confidently traced by the names owning the termination "by" as Derby, and Appleby. Is not the name Dane Road on our own boundary of Lancashire and Cheshire associated with them and their expulsion from Manchester in 910? These Angles, Saxons, Britons, or Welshmen about whom children may be reading and learning will be to them more like actual men of flesh and blood, who indeed trod this same soil which we are treading now when traces can be pointed to, traces surviving to the present day, which they have left behind them and which England as long as it is England, will retain.

Thus, in the teaching of topography, every meaning of a name, every old ruin, every historical monument, memorable site, battlefield or birthplace of the great, that is eloquent of the past, rivets the attention and impresses the name for ever on the memory; parish churches, tombstones, names of streets and squares in a town may be made to yield up their testimony of interesting facts, and with a still louder echo of the past. The mountains of Wales, the forests of Nottingham, and the Fen District proclaim the part they played in the history of England.

Also, as language is the pedigree of nations, and our own especially bears the marks and footprints of its history profoundly impressed upon it, it is easy from its study to recreate the history and its commercial and international relations—for does not the latter depend upon the former! In the Middle Ages, *wool* contributed to shape English policy; cotton and coal largely affect it still, it being a serious matter to engage in a war that will stop the looms of Lancashire or extinguish the furnaces of Staffordshire or South Wales, and statesmen are obliged to give these considerations their full weight. Do not the words Silk, Sarcenet, Gauze and Ermine declare their own origin and remind one of the Crusades,—the power that brought the East into communication with the West, while Indigo, Tobacco and Guinea proclaim their history. Calico and muslin are reminders of changed conditions—the East once supplying the West—now *vice versa*, just as political conditions change especially those which are due to natural resources —the interference of man, and the influences of traders, conquerors or refugees to which a district is subjected, as Lancashire especially is indebted to nature for her wealth and to the Flemings who settled in Manchester in 1363 and laid the foundation of her supremacy in textile manufactures.

And concerning these *natural resources*, a great deal of knowledge of them is gleaned from the study of common things—its purpose being to supply facts, to create an intelligent interest in the common things and phenomena by which one is surrounded—to train the power of observation by seeing and handling them, and by drawing simple inferences from these senses, pave the way for the regular study of science.

A piece of *coal* is a common thing—being black, shiny and of a certain weight. After considerations as to its origin and the mine, comes its influence on industrial conditions, it being the source of our national wealth. The manufactures of the country are carried on—where it abounds—that of cotton, glass and machinery on our own coal field of Lancashire. The absence of coal in the clay and tin districts compel the manufacture of pottery to be elsewhere, and for the same reason the smelting of Australian copper takes place on the S. Wales coal field.

Such lessons in common objects might well include—Manufactures: wearing apparel. Food: forms of employment. Events in national life. Buildings and public monuments, and the construction of simple machines, the benefits of such an elastic scheme being that no interesting topic of the day need be excluded, and having also the scientific spirit for it is well that the youngest should be acquainted with the action of water, and that of a glacier, the formation of steel, and if each separate fact is correlated with something like it an elementary perception at least is gained of physical law.

It would not be difficult to show that almost every new and valuable invention, from the Spinning Jenny to the telephone, which has increased the control of men over nature, economised his time or added to his comfort, is the product of scientific knowledge and often of experiments and researches which had at first no mere utilitarian purpose, but were undertaken with the sole and simple object of discovering the secrets of nature and the laws which govern her phenomena.

A second reason is the extreme *beauty* of the laws themselves, for even if nothing useful were to be gained by the study of science it would be a mistake to pass one's life in the world and catch no echoes of the music of its laws, to be surrounded every day by mysteries, none of which we ever tried to penetrate, to find oneself conveyed 60 miles an hour through the agency of steam, and one's thoughts a thousand times faster by electricity and yet to know nothing of the nature of these forces or the laws of their action, to walk amid flowers and rocks, glaciers and avalanches and to remain uninstructed and untouched by them; only the conscious and systematic study of natural science teaches one to notice and infer rightly from these things.

A mastery of the general principles of geology assists greatly in explaining the origin and meaning of these physical features which play such an important part in civilisation,—a river being a great and a sea a still greater civiliser—internal and external communications between countries being no less in the scale. England is peculiarly fortunate in this respect, no great mountain barriers isolate one part of the country from another, navigable rivers and estuaries are numerous, and where railway or canal communication is not easy the sea is always at hand to convey from one part of the country to another, and also to those countries across the seas, which in one way separate and in another way join us to them.

Sailing across the German Ocean, the Straits of Dover or the English Channel one arrives on the mainland of Europe—the smallest and yet the most prosperous of all the continents—the home of civilisation and of commerce, for the earliest records are of people inhabiting the southern shores, and accordingly there the great events of ancient history had their scenes. We read of the Phœnicians—those great traders and sailors of olden times who explored in three centuries all the islands and shores of the Mediterranean Sea, covering them with their forts, factories, and cities, as well as ploughing the sea in all directions and founding the city of Carthage, which was destined to be the centre of an opulent and powerful state on the N. African coast, growing in greatness as the mother country declined.

It is to the Greeks, particularly their historian, traveller, and geographer Herodotus, who lived 450 years B.C., that the world is indebted for one of the oldest maps issued at the time when Greece was at its height and had established flourishing colonies all around the Mediterranean and Black Seas, and had defeated the Carthaginians.

Roman power arose and spread into Asia, Gaul, &c., and to Strabo of Pontus posterity is indebted for an account of Europe, Asia and Africa, even as far as China, to Ptolemy the celebrated astronomer, who gave to geography the greatest advancement in ancient times, constructing 26 maps, with a general one of the world in illustration of his eight books on this subject.

The fall of the Western Empire of the Romans and the final subjugation of Italy by a barbarian race, whose homes were once on the shores of the Baltic Sea—the Lombards, who gave their name to Lombardy, as did the Goths to Gothland and the Vandals to Andalusia, formerly written Vandalusia—are events which mark the date from which modern history begins, with the supremacy of these races in Western Europe in the 4th, 5th and 6th centuries, gradually forming the new nations, our present neighbours, upon the wreck of Roman power. Nevertheless the spell of it remained—its tradition, glory and history being such as to compel the barbarian rulers to admire and preserve much of Roman law administration and civilisation.

Language is fossil history, and in the name France is preserved a record of that powerful German tribe, the Franks, who gave themselves this name of the proud and free, our own language being indebted to them for the words expressing civil liberties and immunities, Franchise and enfranchisement.

Being German in their origin, and inhabiting the districts lying on the Lower Rhine and Weser, how is it that the French nation has developed so differently from the German? When the Franks conquered Gaul, it had long been a part of the Roman Empire and the inhabitants were either Romans or Romanised Celts, more numerous than the conquerors, who gradually became absorbed in and took many of the characteristics of the conquered race. Germany never belonged to the Roman Empire—Britain was never thoroughly Romanised—and thus while England and Germany became purely Germanic or Teutonic, France was Romance, the Roman law existing in some parts of France right up to the time when Napoleon I. introduced his Code of Laws.

The martial supremacy of the Teutonic races enabled them to keep their slave markets supplied with captives from the Sclavonic tribes, and it is to the degradation of the once glorious name of Sclav, that language is indebted for the word slave—the name for the most degraded condition of man. What centuries of violence and warfare does the history of this word disclose!

The old Greek conquerors and colonists live again in the place names, Mediterranean Sea—the Sea in the middle of the land recalling Herodotus; as well as the story of the "Golden Fleece" in the name Hellespont, for when Helle, the daughter of Zeus, and her brother were fleeing from their stepmother on the back of a winged ram—whose fleece was of gold—and riding on this wonderful animal through the air and over sea and land, Helle unfortunately was seized with giddiness and fell into the sea which bears her name. It was also the scene of the death of Leander, who swam across it every night to visit Hero, represented in that masterpiece of painting by Lord Leighton called "The Last Watch of Hero."

"Bosphorous," meaning Ox ford, is associated with the romance of Europa, from whom the continent is named, the beautiful daughter of the King of Phœnicia, who was carried across it on the back of Zeus, who transformed himself into an ox for this purpose.

The numerous unseen dangers to navigation which abound on the S.W. coast of Italy were personified by the Sirens. The upper part of their bodies were like those of a maiden and the lower those of a sea nymph. Wings were attached to their shoulders, and they were endowed with such wonderful voices that their sweet songs lured mariners to destruction. Odysseus filled the ears of his followers with wax and had himself lashed to the mast of his ship so that he and they might escape this danger.

The dangerous rock "Scylla" was represented by Scylla, a maiden metamorphosed into a monster of terrible aspect, having twelve feet and six heads with six long necks and a voice resembling the bark of a dog. She inhabited a cave at a very great height in the famous rock named after her, and swooped down from it upon every ship that passed, each of her six heads securing a victim.

But leaving the romantic past and studying physical features, it is noticed that Europe, on a map of the world has no right to the name of continent, but is a mere peninsula of a great land mass, the greater portion of which is formed by Asia. The name Eurasia has been given to this land mass, and from some points of view the connection is convenient if not essential; but for most purposes the distinction of the two continents is imperative, being established by history and justified by the physical conditions that have kept them apart, originating where Europe and Asia are separated by water, and which separation is continued on land by a vast area of desert or sparsely peopled territory between the most populous regions of both.

The configuration is similar; the peninsulas, all with one exception, pointing south. The Islands corresponding: the British Isles with Japan; Ceylon with Sicily; Grecian Archipelago with E. Indies; the Atlantic Ocean—the most important, best known, deepest and stormiest—corresponds to the Pacific—the largest and calmest—and the Gulf Stream of the Atlantic corresponds with that of Japan.

In the grandeur of its physical features Europe is the least distinctive, its most striking one being the irregularity and length of coast line. The outcome of varied physical features and consequently varieties of climate and landscape is the great range of character and occupation of their inhabitants, hence the surpassing of all others by European nations, in enterprise, energy, courage, and daring. A great portion of the Old World is under their sway, and the whole of the New World may be said to belong to them and their descendants. The one great central mountain chain stretches from S.W. to N.E. (unlike the New World with its regular chain from N. to S.). The Alps in Europe, monarch of mountains, Mont Blanc, the ascent of which demands an Alpine Guide, the great watershed and one of the factors in the climate besides forming under different names the barriers between several countries and noted beyond all other mountains of the world for—

1. Their *glaciers* or fields of ice. They are formed by the partial melting of the snow on the sides of the lofty mountains during summer, which on the approach of winter is converted into ice and accumulated year by year in the valleys below. Their proximity is dangerous for they occasionally break up and descend to the cultivated valleys in the form of snow slips or *avalanches*.
2. *Passes* or roads over the Alps, are numerous, and the Alpine *Lakes* are of indescribable beauty.

Besides their physical importance, the Alps are noted historically. Hercules is said to have crossed them, and it is certain that Hannibal and Buonaparte did, as the Mount Cenis and Simplon Passes were constructed by the latter for military purposes. The engineering skill that has tunnelled through mountain obstructions (as the Mount Cenis, Simplon and St. Gothard tunnels), bears evidence of the conquest of man over nature.

The rivers of Europe are the great water carriers, and by them the whole of the continent is brought into communication with the Ocean.

But there is one important new element, countries instead of continents.

Complete political wholes, with different appearances, habits, occupations, and races, which have distinctive physical, intellectual and moral characteristics as families have and which assert themselves in a nation's progress. Does not the English race of to-day owe something besides the quickness of apprehension and promptitude in action, great impressibility and eager craving for knowledge which is the brighter aspect of the Celtic character—something to the solid commonsense phlegmatic temper and indomitable enterprise of the German races—something to the bold and enterprising spirit of the Norman?

The natural barriers between these distinctive governments are mountain ranges, a lake or a desert—the Ocean itself being the most uncompromising—being to the great advantage of the United Kingdom, enabling her to dispense with a large standing army but compelling her to maintain a powerful fleet. France and Germany are the reverse, for the Rhine has ceased to be the barrier between them since the Franco-German War of 1870, and now throughout its middle course is a German river, and this being so demanding a strong military force on either side of the frontiers.

Recalling physical influences on industrial developments, a mountainous country like Switzerland presents very different conditions from the well watered plains of Northern Germany or the black earth region of Russia, or the prairies of N. America—even the Highlands of Scotland rearing a distinct type of people—having a different history and development from the Lowlands, and presenting again a marked contrast with the conditions of life and the history of the Sahara.

A widespread network of rivers, as in Europe, gives a great advantage in the development of agricultural resources, and where the streams are deep or broken by waterfalls, they are utilised instead of steam as sources of power for machinery. In Switzerland and Norway electric light is common even in small villages, while below Niagara Falls, on the New York side, the banks of the river are covered with manufactories.

In like manner climatic conditions require to be taken into consideration. One important factor being the proximity of the ocean, the countries of Western Europe enjoy climatic conditions and possess many advantages over those in the East, in similar latitudes, having a more equable distribution of heat and summer besides a more temperate winter than is the case of East Europe, the latter being removed from oceanic influences and open and unsheltered. No mountain chains like the Alps protect them from the piercing cold of northerly winds, their summer consequently being one of intense heat and their winter a season of still intenser cold, with frozen seas and inaccessible ports; while Southern Europe, thanks to the

Alps warding off cold North or North-east winds, cultivates besides the products of the temperate zone the vine, orange and olive in a higher latitude in Europe than anywhere else on the globe.

The affairs of one's neighbours—their advantages and disadvantages—prove, if anything, more interesting than one's own, and Russia, indebted commercially as she is to the River Volga, being the great State that she is, could clearly not be debarred access to ports open all the year; and the pushing outward to the Pacific was inevitable. But what an immense advantage the possession of the Bosphorous and the Dardanelles would be, and such facts well account for the great importance of the "Eastern Question."

Austria-Hungary is an example of disadvantages, having little coast line and that little being only on an arm of an inland sea, shut out from commercial advantages with enterprising neighbours by nature's barriers encircling the whole country, thus forcing merchandise to the sea by the Danube, towards the old passive states instead of the busy centres of Western Europe and the Atlantic Ocean, away from the advancing and active races instead of towards them.

Switzerland, the only country that does not reach the sea coast and surrounded by mountains, is an anomalous state, having no unity whatever in any of those things—race, language and religion—which are the bases of a nationality. It is for the benefit of the world that she should remain autonomous, it being for the general good that the centre of Europe should have no connection with the troubles of the Great Powers surrounding it, and separating inveterate enemies in the past—France and Austria—and shortening frontiers, complications are thus avoided.

Our *German* neighbours, lying in the heart of Europe and surrounded by the most enterprising European nations, are indebted for progression to their canals and coast line which connect them with the granaries and olive regions of Europe, also keeping them in touch with the industrial cities and ports of Western nationalities.

Greater Britain requires even more attention than one's own land and neighbours, for the advantages conferred by colonies on the Mother Country are many though indirect.

In some respects, British expansion has been like that of the City States of Ancient Rome; citizens from them, as from

England, going out to found new communities, and further in being the rule of conquerors, law givers, and governors imposing order, toleration and peace. Ancient Greece is resembled in another respect, expansion being inevitably due to our race with its development of ordered liberty and its innate vigour, to geography, to maritime instinct, to permanent economic causes, and probably the result of all these built on the remains of the three great Ancient Empires.

Without transmarine possessions, no modern nation has held or can hold dominion of the sea, and without that, it is impossible for a small island like Great Britain to maintain her prestige among the nations, for it is noteworthy that as long as Spain, Portugal, Holland, and even Venice and Genoa, held dependencies separated from them by the sea so long were those nations great, powerful, and prosperous, but that from the time they ceased to hold Colonies, they declined in the scale of nations.

It is to the immense population of Britain's Colonial Empire (embracing every race and colour), that a considerable share of her commerce and wealth and no mean portion of her power and prosperity are due, for without them, she would not have such facilities for importing every day commodities, and most certainly not such extensive markets for the export and sale of her manufactures. By her Colonies, the surpassing greatness of Britain has been consolidated, the decay of her population checked, her language diffused, and the unity of the nation strengthened; forming an empire whose extent exceeds anything dreamt of by the most ambitious monarchs of ancient times.

The establishment of Colonies in distant parts during the 16th century, was one of the most important events in the history of the world, the first to lead the way being the Portuguese under Prince Henry the Navigator, their settlements along the shores of the Indian Ocean being made for trading purposes, Vasco di Gama landing in Calicut in 1498. The Dutch, French, and English followed.

Returning to the history of colonisation; the discoveries of Columbus and the conquests of Spain were made chiefly for acquiring gold and silver, not for the sake of colonisation, and seeking only to enrich themselves, the Spaniards plundered and enslaved the native population, Hayti being for a long time their chief station.

The discovery of America excited the desire to acquire new territories, the Portuguese and Spaniards founding their claims on the grants of the Pope, who entrusted to them the conversion of the heathen; while the Dutch and English based theirs upon the rights of discovery. Australia is an example of this, as place names called after the explorers Van Diemen, Tasman, Flinders and the renowned Englishman, Captain Cook, abound.

The consequences of the system of colonisation were of the greatest importance, for they led to a total change in the direction of commerce throughout the world, the overland traffic of Europe and Asia being almost discontinued after the discovery of the passage round the Cape, by Bartholomew Diaz in 1497, and commerce passed from the Mediterranean Sea to Western Europe, which thus acquired an importance it has ever since maintained.

Just as the study of our English language stimulates the memory in the retention of "place names" so our literature abounds in works admirably suited to materially assist in geographical study by keeping the mind open to current events through reading books of travel and lives of explorers. Especially is this applicable to the study of Africa, as the lives of Bruce and Mungo Park show the first attempts to solve some of the great problems which only in recent years have been settled, and the story of the Nile may be studied from Homer and Herodotus down to the time when its secrets have been revealed by the enterprise of Speke, Grant, Baker, Livingstone, and Stanley.

Arctic discovery too offers abundant material for research as the story of the quest for a north-west passage embraces another fascinating division of discovery. From the times of Sebastian Cabot and Frobisher, down to the present day, no prouder records of human courage, endurance, persistence and enterprise are to be found than in the narratives of the successive voyagers who have built up the present-day knowledge of the frozen North. Again, the success of study depends upon the living interest taken in it, so if one wishes to realise the actual description of a country, let Scott's "Antiquary" with an account of the sea in a storm be read; the account of the Western Hebrides in Johnson's "Journey" or Black's "Princess of Thule"; Bryce's account of his ascent of Mount Ararat; or some of the passages of Hooker's Himalayan Journal; and nobody can read Livy's account of Hannibal's passage over the Alps, Macaulay's siege of Londonderry, Carlyle's story of Frederic the Great's campaign in Silesia or Cromwell's Battle of Dunbar without seeing a new meaning in historical geography presenting as it does an almost exhaustless field of investigation.

Literature, too, has its claim upon geography, for from the earliest times, the influence of physical features, especially rivers, is traceable in mythology and legend, in poetry and prose, in fact, all down the literary progress of a race. Spenser and Milton in the past applied some characteristic epithets involving enquiries into physical peculiarities or legendary associations, while Tennyson, Longfellow, Byron, Goldsmith, Shakespeare, do much to clothe the dry bones of learning of almost every part of the world.

And what of Romance—not confined to individuals—for the history of manufactures is aflame with adventure, pathos and tragedy. But are not Art and Music dependent upon Nature for beauty, which inspires the brush to portray those silent and everlasting witnesses of her handiwork? What "Sermons in Stones," "books in the running brooks," and "tongues in trees" must have inspired the composers of the "folk songs," those classics of a nation, the expression of the people of their unaffected patriotism, indeed they are the ground upon which all national music is built up.

Individualities differ and geography directs and fraternises with many. The coverings of the earth, its fruit and flowers, as well as the study of its crust, attract many. The artist, poet and musician seek the beautiful, while the study of the heavens is the lode star of more. The lover of the antique has ample material for research in this, his own city before going further afield to the wonders of Egypt. Politics or the Science or Art of Governments is congenial to many who realise how closely the welfare of a country is bound up with its form of government, and although our own is the envy of the world, every safeguard of English liberties has been again and again contested and dearly bought and held. Some virtues never flourish under a despotism and there are evils inseparable from it, and patriotism dictates that each succeeding generation shall grow up with a full knowledge of the privileges of which it is the heir and guardian. And of the adventurous, true descendants of Drake, Frobisher, Hawkins, Cook and Franklin, the fever of exploration and the thirst for knowledge of the unknown impel them to deeds of daring, truly leaving "foot-prints on the sands of time," and adding to the glory and lustre of their own native land.

Very sincerely Yours
Agnes Deans Cameron

FROM WINNIPEG TO THE ARCTIC OCEAN.

By Miss Agnes Deans Cameron.
(*Author of "The New North*.")

(Addressed to the Society in the Geographical Hall, on Tuesday, April 5th, 1910.)

The Lecturer (see portrait), who visited Britain as the direct representative of the Canadian Government, began her remarks by stating that as the modernization of Japan was the outstanding fact of the last half of the nineteenth century, the appreciation of Canada's destiny would stand out in the years that are to come as the great insistent world fact of the first half of the twentieth century.

Striking reference was made to the fact that when men have gone out from crowded centres to break new ground, the slogan of civilization has ever been "Northward and Westward." On the American continent, the sons and grandsons of those who discovered the St. Lawrence and the Mississippi, went north and west and laid under tribute the Red River and the Assiniboine; north and west they trended and conquered the shores of the Saskatchewan; to-day they are laying strong hands upon the Peace; and before a decade will be plotting townships on the Athabasca, the Liard, the Slave, and the mighty Mackenzie itself. There has always been a West: for the Greeks there was Sicily; Carthage was the western outpost of Tyre; and young Roman patricians went west, conquered Gaul, and speculated in real estate on the sites of London and Manchester. But this West of the Canadian Prairies is the Last West, the last unoccupied frontier under a white man's sky; when this is brought under cultivation pioneering within the British Empire shall be no more.

In the great occupied rectangle of Prairie Canada, *i.e.*, in the lands south of the Saskatchewan, which are already networked by the railways, there lie two hundred million acres of land capable of growing No. 1 Hard wheat, and as yet but five per cent. of this has been turned under to the plough. Basing her conclusions on her own explorations, Miss Cameron estimates that north of the Saskatchewan river, in the great unoccupied valleys of the Mackenzie-River-system is a hinterland containing one hundred million more acres capable of sustaining a white race. This latter untouched heritage was not presented as a field for immediate immigration, but as a great treasure-house for future generations.

Travelling from Edmonton, "the end of steel," for a hundred miles by horses, Athabasca Landing was reached by Miss Cameron early in June. The journey from this point to the Arctic was largely by boat, following the interior waterways—the Athabasca River, Athabasca Lake, Slave River (see Fig. 2), Great Slave Lake, and the mighty Mackenzie, to the Ocean (see Fig. 3). On the return journey, a divergence to the West was made at Fort Chipewyan on Lake Athabasca, the traveller reaching civilization again by way of the Peace River and Lesser Slave Lake.

Travelling under the kindly ægis of the Hudson's Bay Company, Miss Cameron was given opportunity to inspect the old records of the Fur Factors in their various posts. From this mine of unpublished lore, the audience was given many a pleasing item. Sir John Franklin was shown as a pseudo-parson, performing the marriage rites of young servants of the Company in the quadrangle of old Fort Chipewyan. From the point where the Clearwater joins the Athabasca the journey to the Arctic followed in the paddle-prints of Sir Alexander Mackenzie, who gave the giant river its name and followed it to its embouchure in the year 1789. At the very Arctic edge, an interesting link was established between the present and the half-forgotten days of M'Clure's voyages. It will be remembered that M'Clure records having made a present of a piece of red cloth to a little Eskimo girl on Banks' Land, eliciting from the child the quaint question, "Of what animal is this the skin?" Miss Cameron learned from the whalers at Herschel Island of the meeting last season between the Captain of the whaling ship *Olga* and this very Eskimo child, now a bent and aged crone.

The agricultural possibilities of this Great Lone Land as depicted by the lecturer are great. Pictures were shown of wild flax blossoming far within the Arctic Circle, and of goldenrod and wild roses manifesting on the very edge of the Arctic Ocean in fascinating juxtaposition with the tamest of tame Eskimo. It was a revelation to learn that the wheat which took the Highest Award in the Philadelphia Centennial Exposition in 1876 was grown in the little garden back of the

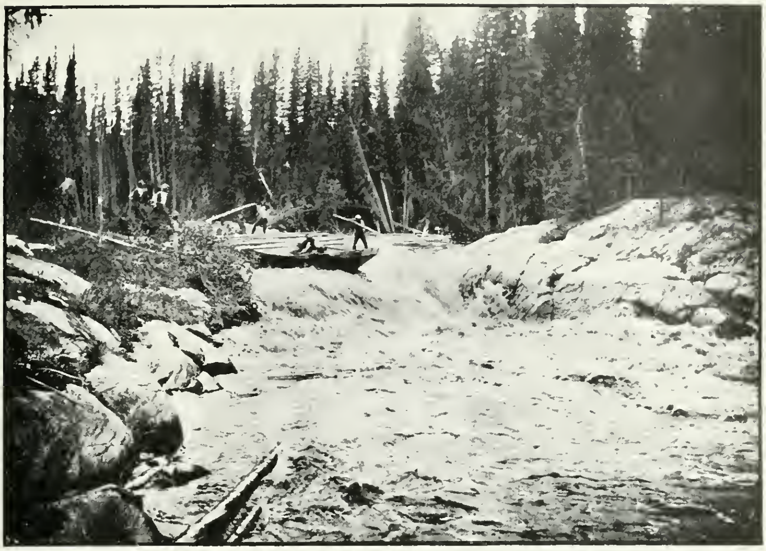

Fig. 2. Canada—The Slave River, opposite Fort Smith.

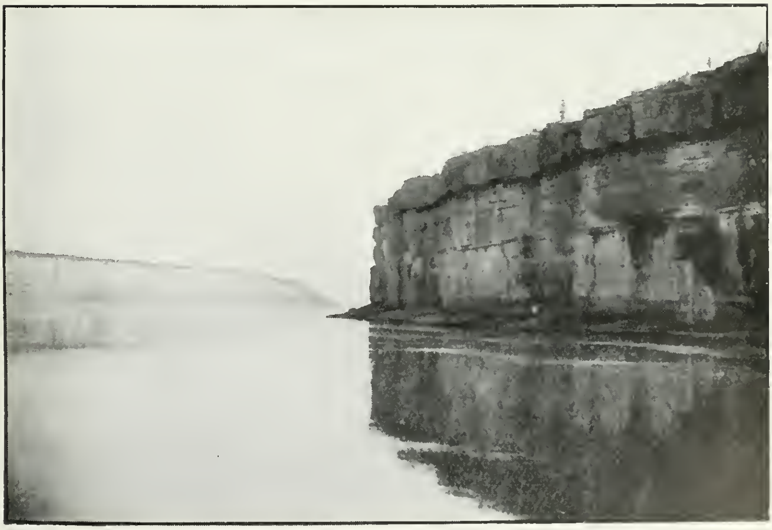

Fig. 3. Canada—The Ramparts of the Mackenzie River. In this defile the river contracts from a width of about 2 miles to about 500 yards, and for 10 miles flows between precipitous limestone cliffs 200 to 300 ft. in height.

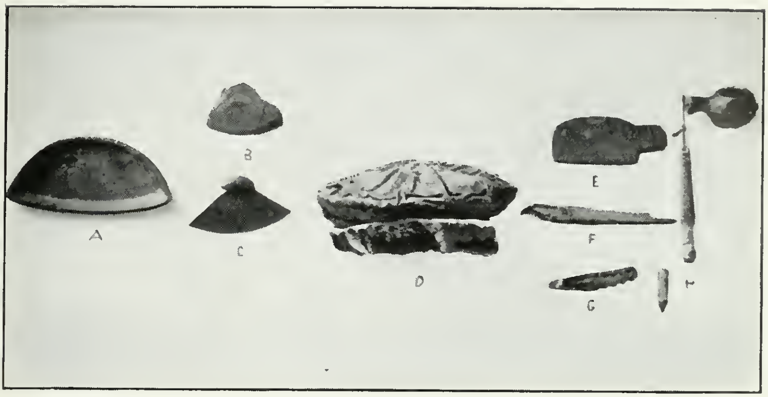

Fig. 4.

A—Eskimo soapstone lamp which burns seal-oil; the wick is of reindeer moss.

B—Eskimo knife of Stone Age.

C—Its modern successor, fashioned from part of a steel saw, with handle of ivory. This is the knife used by the women; note how the old shape is retained.

D—Eskimo Tam O'Shanter. The band is of loonskins, the cap proper being carefully constructed from swans' feet. This admirably shows the cleverness of the Eskimo in adapting natural forms to economic use, each foot of the swan being a true sector of a circle.

E—Old-time stone hatchet.

F & G—Knives filed from saw-blades, with bone handles.

H—Mortar for pulverizing tobacco into snuff.

I—Needle set in a wood handle, and by rapid rotary motion used to pierce ivory.

Note.—These exhibits were all collected by Miss Cameron during her sojourn with the Kogmollyc Eskimo in the summer of 1908, and are here reproduced for the first time.

convent of the Grey Nuns at Fort Chipewyan on Lake Athabasca in latitude 58° 40′ North. A flour-mill belonging to the Hudson's Bay Company which for a decade has been grinding into flour wheat grown in the pleasant pastures of the Peace River in latitude 58° 30′ North (and 400 miles as the crow flies north of any existing railway), proved a picture both illuminating and suggestive (see Fig. 5).

Perhaps of greater historic value than any other picture shown was the view thrown on the canvas of the site of forgotten Fort McLeod, a spot photographed for the first time by Miss Cameron. It was from this far point on the Peace that Alexander Mackenzie in the spring of 1793 launched his canoes on that history-making journey which found its final goal on the Pacific edge, and which enabled him to write with his vermilion-brush on the black rock of the British Columbia coast the historic inscription, "ALEXANDER MACKENZIE FROM CANADA BY LAND 1793." Alexander Mackenzie was the first man to cross the American continent from ocean to ocean north of the latitude of Mexico, and there is considerable satisfaction in the thought that the Hudson's Bay Company has given its assurance to Miss Cameron that the site of his initial camp will not be suffered longer to remain unmarked by suitable memorial.

Miss Cameron's testimony regarding the big game of North Canada is optimistic. She reports that the herd of 350 to 500 wood-bison on the Slave River is maintaining its own numerically, being protected by a special detachment of the Royal North-west Mounted Police from the ravages of its two possible enemies, the timber wolf and the Fort Smith Indian. Regarding the reindeer or Barren Land caribou also, the fur-traders on the shores of Great Slave Lake report no diminution of the herds. The musk-ox still holds his own on that great stretch of country lying north and east of Great Bear and Great Slave Lakes, a country, by the way, which the lecturer declares to be covered with succulent and nourishing herbage, and to be "barren" only in the sense that it is treeless. Miss Cameron herself met a timber wolf at close range while doing some exploration work on the north bank of the Peace River, but was unable to obtain either a rifle-shot or a camera-shot at the huge beast. Better fortune awaited her in the moose line, a much appreciated young moose falling to her rifle near the Peace River Crossing. The pictures of game-fish thrown on the screen stirred all sorts of envious thought in the breasts of listening anglers. Thirty-pound trout rose to the fly on Athabasca Lake, and splendid grayling were taken on the north shore of Great Slave Lake. This country will one day be much sought by devotees of the reel and rod.

Miss Cameron's whole address can be characterized as a lesson in Empire Geography and History. Many a fascinating glimpse was given of the folk who so sturdily held this far fringe of Empire and made history all unrecorded until Miss Cameron unearthed it. An example may be given. Old Fort Simpson on the Mackenzie River, in latitude 62° North, is rich in records. Here lie the mouldy remains of America's Farthest North library, and here too the journals of the Fur Factors are lush with records of the long ago. What was doing on this edge of things in the year when Queen Victoria ascended her throne? Let Miss Cameron's excerpts from the old journals tell:—

> "1837, January 1st. The people were brought into the Hall and treated to a glass of wine, a fathom of tobacco and a pipe. Wind east."
>
> "1837, February 11th. Rabbits are numerous, but the ladies of the Establishment make no great effort in snaring them."
>
> "1837, March 27th. Two geese have been seen to-day."
>
> "1837, May 2nd. Marcel sowed some oats. Mosquitoes annoying."
>
> "1837, May 5th. Willows and young trees budding beautifully."
>
> "1837, May 19th. Felix and Roderick Macleod made 12 bags of pemmican."
>
> "1837, June 20th. Thermometer 85° above at 3 p.m."
>
> "1837, July 26th. Small birds nip off the ends of the barley stalks as fast as it ripens."
>
> "1837, September 18th. An express arrived from Fort Norman with despatches from the gentlemen of the Arctic Discovery Expedition, and it is most satisfying to learn that the first object of the Expedition was successfully accomplished: on the 4th August the Company's flag was planted on Point Barrow."
>
> "1837, November 5th. Blacksmith making iron runners for our Traineaux from old gun-barrels."

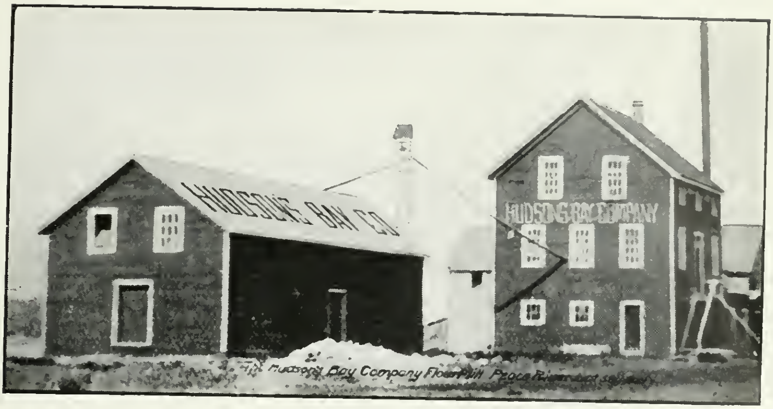

Fig. 5. Canada—The Most Northerly Flour Mill in America, situated at Fort Vermilion on the Peace River.

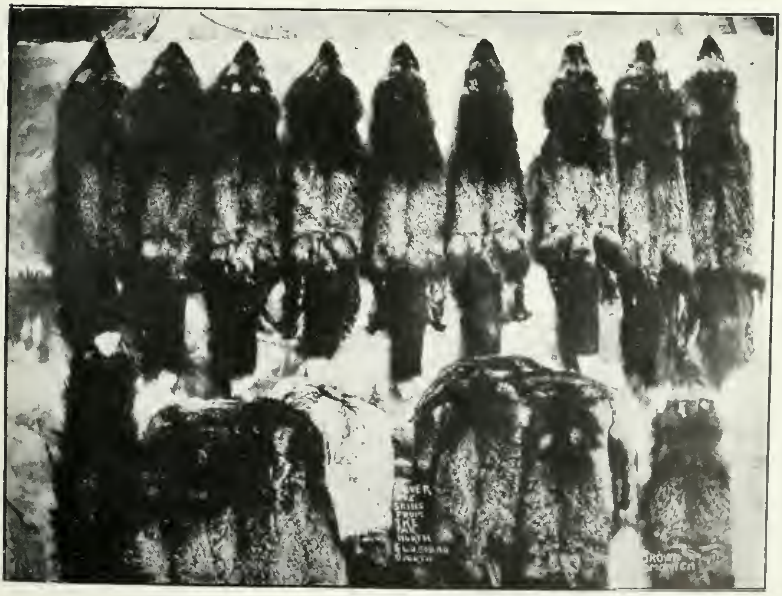

Fig. 6. Canada—Display of £8,000 worth of Silver-fox furs, taken in the land of the Nunatalmute Eskimo.

> "1837, November 30th. This being the anniversary of the tutelar Saint of Scotland, we had in addition to our usual dinner a roasted swan and a moose-nose, a rice pudding, a cranberry tart, and a glass of wine."
>
> "1838, January 1st. In conformity to the custom of the country, our people were treated, the men with half a glass of brandy each and the women with a kiss."

Coming down again to the prairie wheat-belt, the lecturer left her audience with an illuminating insight into this fascinating section, "Britain's Bread-Basket," a great bread-yielding plain one thousand miles in length, and of unknown width, the largest wheat-farm in the world. This was characterized as "a Crucible of Colonization," "a Melting-Pot of Humanity." Of the 200,000 immigrants arriving in Canada in the fiscal year ending March 31, 1910, as many as 125,000 were adult males. Half of the total influx belonged to the farming class, and half of the whole immigration came from the United States. There were 97 arrivals from South Africa, 203 from Australia, 82 from New Zealand, 203 from the West Indies, with 2,100 Chinese, 270 Japs, and 10 Hindoos.

A high tribute was paid to Dr. Barnardo's organization, which sent to Canada last year over 1,000 children, for whom no fewer than 12,382 applications were made by well-to-do farmers and farmers' wives anxious to adopt into their homes these little outcasts gathered from the highways and alleys of the Old Land. The striking statement was made that of these Barnardo waifs each year 97 per cent., to use the Western phrase, "make good" in the New Land of Opportunity. It was here that the lecturer made her strong plea that the Motherland would send an increasing number of these young citizens across the water that Canada might put their feet upon the land, surround them by motherly and loving care on the farms, and give to each his divine birthright, a chance to make a living with his hands under the open sky of heaven.

The closing appeal of the speaker was, "Give us of your young and healthy children, those that you are now institutionalizing in your workhouses and eleemosynary institutions, destroying every spark of their independence and individuality —and let Canada make for you of them Empire Citizens! Canada can do this for you; she will also on her great wheat-plain make for the Motherland all your 'Standard Bread' if you will only allow her the opportunity."

THE WONDERLAND OF ALASKA.

The Country, its People, and its Treasures.

By James E. Liddiard, F.R.G.S.

(A short report of the Lecture given to the Society on Tuesday, January 18th, 1910.)

The great River St. Lawrence is remarkable for its natural beauty, and has been described as "a magnificent preface to a grand volume of geography." Quebec and Montreal were dealt with in passing, then, after crossing 2,906 miles of country on the Canadian Pacific Railway, Vancouver was reached. The final calling places were Victoria, the beautiful capital of British Columbia, and Esquimault, the North Pacific Naval Station.

Alaska is so much grander than anything else of the kind that once beheld all other scenery becomes flat and insipid. Its beauties are marvellous, and the land also contained a rich store of treasures. The total area is 590,884 square miles. Until 1867 Alaska was held by Russia, when it was purchased by the United States Government for 7,200,000 dollars. Regarded only as a financial investment, it has been very profitable, for the Government up to 1903 had received back in revenue over £400,000 more than the cost of purchase. The census of the population taken in 1900 was found to be 63,592, including about 30,500 white people, and the proportion of these latter has increased considerably since the gold rush.

In the summer, Alaska is the land of sounds, echoing with the voices of birds and rippling running water; while, in the winter, it is the land of silence, its great rivers shimmering in the moonlight wrapped in sheets of ice, and producing a weird and spectral scene. There are charming surprises in store everywhere; lovely landscapes, wild flowers of every hue, the finest forests, most majestical of mountains, the grandest of glaciers, cliffs of colour unspeakable and treasures beyond price.

It is a land of boundless wealth, millions of dollars had come from there in the past, and hundreds of millions would be reaped in the future. The minerals are simply beyond computation, gold is plentiful, also silver, copper and coal; and almost every other kind of mineral exists there. Next stood her piscatorial wealth. Twenty-five species of food fish are to be found, including cod and salmon, besides valuable fur seal fisheries.

The Lecturer first visited the mining town of Juneau, where the annual rainfall is 9 ft. compared with about 25 inches in England. In Douglas Island is situated the largest gold mine in the world. A gold nugget weighing 182 ounces was recently found there, and also a nugget of pure copper weighing four tons.

The Klondyke district was next visited, Dawson City being specially noted. It is a fine city, lighted by electricity. The temperature in this golden territory goes down to even seventy degrees below zero. At Pribylov Islands are to be seen the strange seal rookeries, where over one million baby seals are born every year.

Another striking feature is Mount St. Elias; until the summer of 1897 no human foot had ever trodden its summit. It was ascended in that year by the Duke of Abruzzi. Glacier Bay, with its immense glaciers of wonderful shapes and sizes, is a remarkable sight. Sitka is the capital of Alaska, and has most picturesque surroundings.

In conclusion, reference was made to the good work done among the natives of Alaska by the missionary William Duncan, who founded the model settlement of New Metlakahtla, and under whose guidance remarkable advancement has been made towards civilization and Christianity; and Lord Aberdeen's striking testimony to the work and character of Duncan was quoted.

Proceedings of the Society.

April 1st to June 30th, 1910.

The 854th Meeting of the Society was held on Tuesday, April 5th, 1910, at 7-30 p.m.

In the Chair, Mr. J. Howard Reed, F.R.G.S.

The Minutes of the Meeting held on March 22nd were taken as read.

The Chairman announced that the Right Hon. the Earl of Derby, G.C.V.O., had consented to join the Society, and to be elected a Vice-President in place of his father.

Miss Agnes Deans Cameron described her journey "From Winnipeg to the Arctic Ocean." This was the story of Canada's Wheat Belt and the fascinating land that lies beyond it, as revealed by a journey down the Athabasca River, across Lakes Athabasca and Great Slave and down the mighty Mackenzie to its embouchure in the Polar Ocean. The story was made doubly interesting by being illustrated with the Lecturer's own photographs (see p. 97).

On the motion of Miss K. Qualtrough seconded by Mrs. D. A. Little it was unanimously resolved that the hearty thanks of those present be given to Miss Cameron for the very interesting account she had given of her journey.

The 855th Meeting of the Society was held in the Free Trade Hall on Friday, June 3rd, 1910, at 8-0 p.m., when Commander R. E. Peary, U.S.N., F.R.G.S., gave a Lecture entitled "How I Reached the Pole." The Lecture was illustrated with lantern slides shown by Mr. E. W. Mellor, J.P., F.R.G.S., by means of his powerful electric lantern.

A full account of the proceedings in connection with the visit of Commander Peary to Manchester is given below:—

RECEPTION OF COMMANDER PEARY.

Commander Peary, the discoverer of the North Pole, arrived in Manchester shortly after two o'clock in the afternoon, and was met at London-road Station by the Lord Mayor (Mr. Councillor C. Behrens, J.P.), with Mr. F. Zimmern, F.R.G.S. and Mr. Harry Sowerbutts, Assoc.R.C.Sc., the vice-chairman and secretary of the Geographical Society. The explorer was driven in the Lord Mayor's coach to the Royal Exchange, where he witnessed High 'Change, one of the show sights of the city. He was received in the directors' room by Mr. A Haworth, M.P., chairman, and by other members of the Board, with Mr. R. J. Allen, the Master. Commander Peary was afterwards conducted to the distinguished visitors' gallery, where he stood for a few moments in company with the Lord Mayor and Mr. Haworth. When the members found who was among them business was momentarily suspended, and the thousands on 'Change turned their gaze upwards to where the man who had been "Farthest North" was standing. Mr. Haworth pointed out to the explorer the various objects of interest connected with the Exchange, but the Commander did not yield to the cries for a speech which came from below. In any case, he could scarcely have made himself heard from such a lofty elevation. Commander Peary signed the visitors' book before leaving the Exchange, from whence he drove with the Lord Mayor, whose guest he was during his stay in the city, to the Town Hall. On his arrival he looked in at the annual meeting of the local branch of the Navy League, which happened to be in progress. In response to a hearty invitation to speak, the distinguished representative of the United States Navy briefly said he was delighted at the opportunity of meeting in the Town Hall such a large contingent of those who were interested in the British Navy.

AT THE FREE TRADE HALL.

The Lord Mayor presided at the Free Trade Hall meeting, and among those supporting him, were the Lady Mayoress, the Mayor of Salford (Alderman J. Snape), Rt. Rev. Bishop Welldon, Mr. F.

Zimmern, F.R.G.S., Mr. J. Howard Reed, F.R.G.S., (hon. secretary of the Manchester Geographical Society), Prof. W. Boyd Dawkins, J.P., F.R.S., Colonel W. E. Greg, J.P., F.R.G.S., Messrs. J. G. Groves, J.P., J. MacFarlane, M.A., F.R.G.S., C. A. Clarke, George Ginger, James Barningham, J Howard Hall, T. C. Middleton, J.P., F. S. Oppenheim, M.A., R. Cobden Phillips, A. Rée, Ph.D., George Thomas, T. W. Sowerbutts F.S.A.A., J. Stephenson Reid, Theodore Gregory, J.P., F.C.A., Harry Sowerbutts, Assoc.R.C.Sc. and G. H. Warren.

Introducing the Lecturer, the Lord Mayor said that during his term of office it had fallen to his lot to welcome several renowned travellers by land, by sea, and lastly, by air. Their visits, he thought, were a complete answer to many unkind accusations levelled against Manchester that its one aim and ambition was simply to make money. At any rate, the visitors he spoke of would not endorse this allegation, because no one coming among them in Manchester, whether bearing the laurels of great achievement, or setting out to win them, failed to receive the most hearty sympathy, and often the most practical kind of encouragement. From the Seventeenth Century, when Henry Hudson started out to find the Pole, many others had devoted their energies to the task, and some of England's greatest had given their lives. But now the task of centuries was done, and Commander Peary had reached the goal and planted the stars and stripes at the North Pole. He was sure the Commander would excuse a little natural chagrin on their part than an Englishman was not the first, but, next to a Briton, there was no one whose success would have given them more pleasure than one of their American cousins. (*Manchester Courier*).

Commander Peary who was warmly welcomed on rising to give his lecture said: "I very deeply appreciate the kindly expressions of your Lord Mayor. I thank you for your generous welcome, and I congratulate Manchester upon its courage in inviting here those who have explored to the South and to the North Pole and also the denizens of the air. I am sorry that I cannot interest Manchester in the Arctic regions in the way of business. I do not think there will be much cotton grown there. But in regard to what the Lord Mayor said as to the feeling of Great Britain about the final attainment of the North Pole by men of another nationality than theirs no people will be more delighted than we of the United States when the British ensign flies at the South Pole.

Commander Peary then plunged into the subject of his lecture, recalling the days of two years ago when the Peary Arctic Club was fitting out the expedition to the North Pole. He had time in this lecture neither for the details of those preparations nor for the earlier stages of the northern voyage. It was necessary to plunge "into the midst of things," and this Commander Peary proceeded to do, giving only a brief lesson in the geography of the Arctic regions with two historical dates—July 6th, 1908, when the expedition left New York, and April 8th, 1909, when the North Pole was reached. The first of the many vivid photographs were those of Far Northern Esquimaux, with their facial characteristics indicating an oriental origin. An Esquimaux girl whom Mrs. Peary took to Washington, saw some Chinese people in the street and ran across the road to them, taking them and being taken by them in return, for fellow-countrymen. Then there were the Esquimaux dogs, capable of working at high pressure on almost nothing to eat. Nothing was more warmly cheered in the Lecture than Commander Peary's insistence on the good condition of these dogs to the end of the expedition, a state of things due to the double rations which he was able to give them, this again being due to the speed of the journey there and back.

Before the last stage of the voyage across the ice of the Polar Sea, Commander Peary made many observations of animal life and he showed photographs, some taken by flashlight, of birds and animals, including one of a polar-bear held up by the Esquimaux a few minutes after it was shot,"sitting up for its photograph after it was dead," as Commander Peary said. (*Manchester Guardian*).

Taking up the trail from Cape Columbia on the final march of over 400 miles to the Pole, there were many fascinating touches about the explorer's description of the arduous achievement. It was to his system of supporting parties, left behind at stated intervals as he gradually advanced, that he owed the rapidity of his return. It was a march of difficulty in many ways. The Central Polar Sea is not fixed and immovable. In 24 hours a strong wind will set the great fields of ice slightly sagging, and an expedition, picking up their road home, find strange faults and twists in the trail, though not sufficient to confuse them seriously. However, Commander Peary emphasised the point that it was only by means of his elaborate system of supports that he was able to return to his base at the unusual speed with which he travelled. He spoke of the leads—the open stretches of water which break the long monotony of the ice—as an ever-present nightmare to the Polar traveller. They were the main obstacle on the journey north and, coming back, they might at any moment cut him off from land and life itself. There were several ways of crossing these lanes of water. One was to make a detour, another to wait for the ice to close, and a third to find a piece of ice which could be used as a kind of ferry boat. Regarding the temperature in which all this work of travelling and observation was done, the lecturer said the lowest they had was 59 degrees below zero, Fahrenheit, and the highest 11 degrees below zero. Their clothing was the outcome of generations of Esquimaux experience: "A fur coat with no opening, front, back, or side, pulled down like a sweater, with a hood forming part of the garment. Trousers made of bear skin, stockings of hareskin and boots of sealskin." The whole costume weighed 12½lb., and attired in it he could lie down in the snow, so long as there was no wind, with the thermometer at 55 degrees below zero, and sleep with tolerable comfort.

Commander Peary attached much importance to the alcohol stoves which were used by the parties. In twenty minutes ice was transformed by the stoves into boiling tea, whereas the meal of the Arctic explorer used to take two hours to cook—a valuable saving of time.

The picture which elicited from the audience the heartiest round of applause was the last marching party at the Polar degree itself, with the Stars and Stripes floating from a convenient ice hummock. Commander Peary himself must have taken the view, for the picture shows only a group of five under the flag—four Esquimaux and the coloured man who was with him to the end of the journey. "What were my sensations at this moment"? He had often been asked that question. "I had spent," said the explorer, "23 years of my life in trying to reach this point. It had been an object of endeavour for men of every civilised nation for almost four centuries. If it were possible to reach that point without exhaustion, if it were possible to have leisure to work oneself into a state of mental hysteria, one would undoubtedly have the sensation of a lifetime. We were over tired. My only sensation was one of intense satisfaction, of intense gratification, that at last, in spite of every obstacle the Arctic region could interpose, I had 'made good' to myself and my friends.'

After a few miles' progress on the return journey from the latitude which marks the situationof the Pole, Commander Peary took a sounding through the ice, which he described as of the utmost interest to the scientist and geologist. The wire snapped when they were drawing up, but it had run out 9,000 feet without touching bottom, and this attempt to plumb the depths practically at the Pole itself proved that the Polar Sea was not a shallow one. It was probably more than two miles deep. Back to land once more after long days of arduous marches. Free of the strain of constant travel, with no further fear of the treacherous leads, the Esquimaux of his party went almost crazy with delight. They were dancing and singing, and he overheard one of them give a comforting little assurance to another member of the tribe, which Commander Peary freely translated as follows: "I am sure the devil has been asleep while we've been gone, or else he has been having a family discussion with Mrs. Devil."

On April 23rd the returning expedition saw the vertical face of the land ice. "We were not hungry when we got back; we had not been on half rations. But the men and the dogs were literally lifeless from loss of sleep," and Commander Peary told how his party slept for nearly forty-eight hours now that the critical part of the journey back was safely done.

Views of the faces of the Esquimaux, "before and after," were eloquent proof of the terrible strain imposed by the expedition. After looking, first on round smiling faces and then on gaunt sunken cheeks, it needed not the lecturer's comments that "it took all the fierce energy and grim determination of these iron men of the frozen North to carry through those 400 miles from Cape Columbia to the Pole and back again." Finally, he said: "We have been waiting nearly 400 years to hear this story. Now it is told, it happens that we of the United States feel a special interest in it, but it has meanings for everyone. It is another step in man's certain conquest of the globe on which we live. For the young it may stand as the inevitable victory of perseverance over every obstacle, and as the removal of a four-hundred-year-old challenge to our manhood and our civilisation."

Mr. F. Zimmern moved a vote of thanks to Commander Peary "for his fascinating narrative so vividly told and so beautifully illustrated." In connection with the vote he presented to the explorer a document enrolling him as an honorary member of the Manchester Geographical Society.

Mr. J. Howard Reed seconded the vote of thanks and also expressed the indebtedness of the meeting to Mr. Mellor for his valuable assistance with the lantern. The resolution was carried unanimously.

Commander Peary briefly acknowledged the vote of thanks, and also what he described as the entirely unexpected honour paid him by the Geographical Society. He moved the thanks of the meeting to the Lord Mayor for presiding.

This was seconded by Bishop Welldon, and, after it had been carried and responded to by his Lordship, the proceedings terminated. (*Manchester Courier*).

The 856th Meeting of the Society was held at Norcliffe Hall, Styal, on Saturday, June 18th, 1910.

A considerable number of members accepted the kind invitation of Colonel E. W. Greg, J. P., F.R.G.S. to visit the grounds of Norcliffe Hall. Colonel and Mrs. Greg received the party on the Terrace with gracious hospitality.

After the view from the terrace had been greatly admired, Colonel Greg led the members for a stroll through the grounds and gardens. The weather being delightfully fine, the walk under the trees and down and up the steep banks of the stream was thoroughly enjoyed, and under the direction of the leader, was found full of interest. Among other objects noted was a tree, Wellingtonia Gigantea from California, planted, when three feet high, in 1858 by the late H. P. Greg; it has grown to a height of over 20 feet, but it is probable that it will not increase much, if any, more, as the cold winds of this country have a very injurious effect on this kind of tree.

After tea, Councillor S. W. Royse, J.P. moved and Mr. E. Oldham, J.P., seconded a hearty vote of thanks to Colonel and Mrs. Greg for the gracious reception and kind hospitality. The resolution, which was passed unanimously with acclamation, was acknowledged in an appropriate manner by Colonel Greg on behalf of Mrs. Greg and himself.

Review.

"A Course of Elementary Studies in Geography." By H. J. Mackinder, M.A. Geo. Philip & Son., Ltd. Large crown 8vo, in four books: I. "Our Own Islands," II. "Lands Beyond the Channel," III. "Distant Lands," and IV "The Nations of the Modern World."

These little books are an actual incentive to the study of geography. We know of no better introduction to the science. As Readers we think them excellent; as Text-books we cannot admit quite so much. In a simple and pleasant manner, nowhere lacking coherency, the author has brought to bear an acute knowledge of his subject, and has cleverly condensed and clearly expounded it. In the preface to the first book of the series ("Our Own Islands") he has written: "In this little book an attempt is made to teach some geography to children, with a human meaning in each chapter, and no unnecessary names." He has succeeded admirably. History and geography have ever been, and must ever be, indissolubly linked together. Acquisition of the one should and will mean acquisition of the other. In these books the author has so promulgated and sustained this happy union that we feel it no ordinary satisfaction to recommend the books even to the general reader, despite their designation "Elementary studies." And we will venture to add that if anyone would like to be awakened to the fact of how little he knows of geography and history in conjunction, or perhaps better, of how much he has forgotten, let him read through, not one book, but the four. Dry-as-dust they are not in any sense. From first to last they are as entertaining as they are useful. The type is large and clear, and the printing is good. The whole is pleasingly illustrated and freely mapped.

W. H. W.

The Journal
OF THE
Manchester Geographical Society.

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EXPLORATIONS IN CENTRAL ASIA, 1906-8.*

By Dr. M. Aurel Stein, F.R.G.S.

(Addressed to the Society in the Chemical Lecture Theatre, Manchester University, on Tuesday, October 11th, 1910.)

Ever since, in 1901, I had returned from my first journey into Chinese Turkestan happy recollections of congenial labour spent in its mountains and deserts had made me long for a chance of fresh explorations. There was reason to hope that the ruins of sites long ago abandoned to the desert would yield more relics of that ancient civilization which as the joint product of Indian, Chinese and classical influences had once flourished in the Tarim Basin and upon which it had been my good fortune to throw light by my former excavations. But the elaboration of the scientific results of that expedition by the side of exacting official duties took time and so also the efforts needed to secure freedom and the means for a fresh journey. At last, in 1905, these were assured to me when the Government of India, then under Lord Curzon as Viceroy, liberally sanctioned my proposed explorations and agreed to bear their cost, helped by a generous contribution of two-fifths from the British Museum Trustees.

A kindly Fate has allowed me to carry through my archæological tasks and the geographical explorations which formed from the outset part of my programme in their entirety and with abundant results. But their very extent which is sufficiently indicated by the length of the time spent over constant work and travel, two years and eight months, and by an aggregate marching distance of 10,000 miles, make it difficult at the present stage to give anything more than a rapid survey. Even this would probably take double or treble the time here available. So I must restrict myself to presenting mere extracts likely to show the character of the work accomplished and the type of the personal experiences which accompanied it.

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For my entry into Chinese Turkestan I had chosen this time a route singularly interesting for the student of early geography and ethnography but practically closed now to the European traveller. It was to take me from the Peshawar District, the ancient Gandhara, through the independent tribal territory of Swat and Dir, into Chitral and thence to the Upper Oxus valley and the Afghan Pamirs. My lamented late chief, Sir Harold Deane, that truly great Warden of the Marches, had readily agreed to my project, and H. M. the Amir of Afghanistan, too, had granted me permission to cross that portion of his territory not visited by any European since the days of the Pamir Boundary Commission. But the difficult Lowarai Pass, then deeply buried under snow, still interposed a formidable barrier. So it was not until the 28th of April, 1906, that I was able to leave Fort Chakdarra, the scene of such hard fighting during the last great tribal rising. In the meantime I had been joined by my Indian assistants, Rai Ram Singh, the excellent native Surveyor who had accompanied me on my former journey, and by worthy Naik Ram Singh, a corporal of the First Sappers and Miners, who was to act as my 'handy man.'

My journey was to take me not to distant regions alone but also far back in the ages. So it was doubly appropriate that its first stages should lead through trans-border valleys which twenty-two centuries ago had seen the conquering columns of Alexander pass by, and which still display in plenty ruins of Buddhist times. May 3rd found us at the foot of the dreaded Lowarai Pass (10,200 ft.), and our crossing, effected before daybreak through gorges deeply choked with the snows of avalanches, some quite recent, showed that the difficulties had scarcely been exaggerated. With this obstacle once safely taken I could rapidly push up the deep cut valley of the Chitral river to Fort Drosh, and thence with the huge icy mass of the Tirichmir Peak (25,000 ft.) in full view northward, to the Chitral capital. During the few days of halt there I was able to gather an ample anthropometrical harvest. In its autochthonal population Chitral holds an important branch of that 'Dard' race which by its antiquity and ethnic and linguistic affinities may well claim the special interest of the historical student and ethnographer.

The survival of much ancient lore in customs, traditions, crafts and even in domestic architecture makes Chitral and the adjacent valleys a fascinating field for the student of early Indian civilization. It was with regret, therefore, that I yielded to a variety of cogent practical reasons urging me onwards to the Oxus and the 'Roof of the World.'

I was soon able to verify the accuracy of those Chinese annalists who are our chief guides in the early history and geography of Central Asia by tracing the route over the Baroghil and Darkot Passes, by which in 749 A.D. a Chinese army coming from Kashgar and across the Pamirs had successfully invaded the territories of Yasin and Gilgit, then held by the Tibetans. It was a remarkable exploit considering the formidable natural barriers which the Pamirs and Hindu-kush present to military action. The ascent of the Darkot Pass, circ. 15,400 feet above the sea, which I undertook with this object on May 17th, proved a very trying affair; for the miles of magnificent glacier over which the ascent led from the north, were still covered by deep masses of snow, and only after nine hours of toil in soft snow hiding much crevassed ice did we reach the top of the pass.

On May 19th we crossed the Hindu-kush main range over its lowest depression, the Baroghil. Owing to the abnormally heavy snow-fall of that year the masses of snow on it were so great that but for the timely assistance sent from the Afghan side on the Oxus it would have been quite impossible to get our loads across. At Sarhad, the highest village on the Oxus, the kindest reception awaited me. Colonel Shirindil Khan, commanding the Afghan frontier garrisons from Badakhshan upwards, had been sent up weeks before with an imposing escort. The presence of this delightful old warrior who had fought through all the troubled times preceding and immediately following Amir Abdurrahman's accession, would alone have been an inducement to tarry by the Oxus; for I found him not only full of interesting information about ancient remains in Badakhshan and old Bactra, but himself also as it were a fascinating historical record. Was it not like being shifted back many centuries to find myself listening to this amiable and gentlemanly old soldier who in his younger days had helped in building up pyramids of rebel heads just to establish order in the time-honoured fashion of Central Asia?

Our marches up the Oxus were exceptionally trying owing to the fact that the winter route in the Oxus bed was already closed by the flooded river while impracticable masses of snow still covered the high summer track. Again and again only the incessant watchfulness of our Afghan escort saved the baggage from bounding down into the river. It was the uppermost course of the Ab-i-Panja which brought us on May 27th to the foot of the Wakhjir Pass (16,200 ft.), and the glaciers where Lord Curzon has placed, I think rightly, the true source of the Oxus. A long day of toil saw us crossing the pass and with it the Afghan-Chinese border. We started by 3 a.m. after a hearty farewell to the kindly Afghan Colonel. Enormous masses of snow still covered the Wakhjir, and it was not until midnight that I found rest at the first point on the Chinese side where fuel and a dry spot to lie down on were available.

Moving down the Taghdumbash Pamir I found myself once more on the ancient route which Hsüan Tsang, the great Chinese pilgrim, had followed when returning in 649 A.D. from his long travels in India. I was able to identify here the ruined rock fastness where a curious local legend related by the pilgrim supposed an imperial princess from China to have been imprisoned in ancient days.

I was still on Hsüan Tsang's track when I moved from Sarikol by a succession of rapid marches across the high Chichiklik Dawan and a succession of minor passes to Kashgar. There under the hospitable roof of my old friend Mr. Macartney, now H.M.'s Consul, a host of practical tasks connected with the organization of my caravan kept me busy for a fortnight. Mr. Macartney's kind offices were of great help in securing the goodwill of the provincial Chinese Government for my fresh explorations. But it was a service of quite as great importance when he recommended to me a qualified Chinese secretary in the person of Chiang-ssu-yieh. For the tasks before me the help of a Chinese scholar had appeared from the first indispensable. It was a piece of real good fortune which gave me in Chiang-ssu-yieh not merely an excellent teacher and secretary, but a devoted helpmate ever ready to face hardships for the sake of my scientific interests. With the true historical sense innate to every educated Chinese he took to archæological work

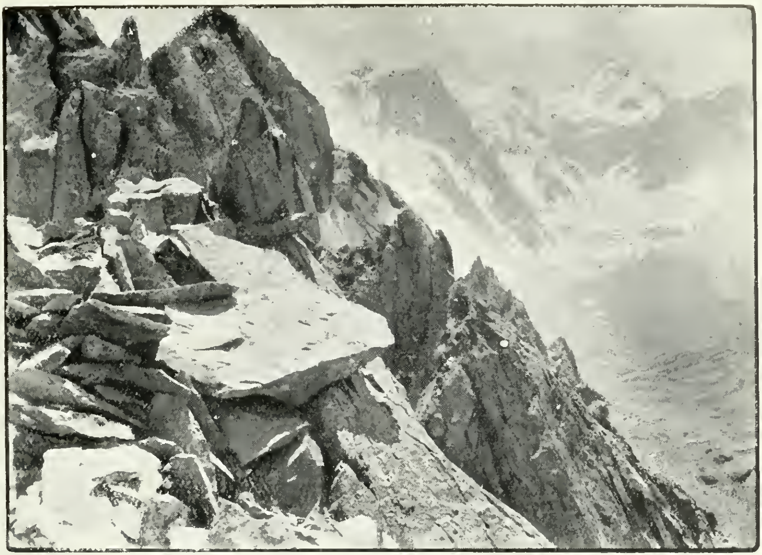


Fig. 1. Kashkul Glacier, above Nissa Valley.

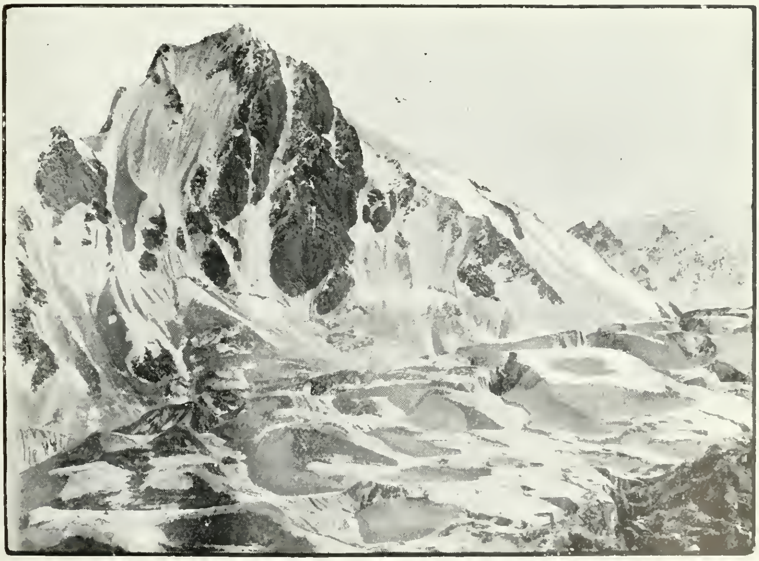


Fig. 2. View eastwards from Otrughul Glacier.

like a young duck to the water. I am glad that the Government of India have, since my return, seen fit to reward his devoted services to me by the honour of a valuable present.

When on June 23rd I started from Kashgar, Khotan was my goal. But owing to the great summer heat of the plains the work of exploring ancient sites in the desert could not be thought of until September. So I was free in the meantime to turn my attention to geographical and other tasks. Thus at Kökyar at the foot of the Kun-lun I was busy collecting anthropological measurements and data about the little known people of Pakhpo. This small semi-nomadic hill tribe in its alpine isolation proved to have preserved remarkably well the main physical features of the Homo Alpinus type which in ancient times appears to have extended right through to Khotan and even further east.

By a little-known route leading through the barren outer hills I made my way to Khotan by the beginning of August. A few days among my old haunts in this flourishing great oasis sufficed for putting myself into touch with the local Chinese authorities and setting on foot enquiries likely to guide me in my subsequent archæological search. Then I set out with Ram Singh for the high Kun-lun range south of Khotan in order to supplement our surveys of 1900 by ampler topographical details about the great glaciers which feed the head waters of the Yurung-kash. Pushing up rapidly we reached the Nissa Valley after the middle of August and were soon busily engaged mapping the huge ice streams which descend towards its head both from the main Kun-lun watershed and great side-spurs.

The effects of far-advanced disintegration of rocks were everywhere most striking. The precipitous ridges we had to climb for the sake of survey stations were composed on their crests of nothing but enormous rock fragments heaped up as by the hands of Titans and quite bare of detritus from circ. 14,000 feet upwards (Fig. 1). Enormous masses of rock débris sent down from these ridges almost smothered the ice-streams below. Even near big ice falls and gaping crevasses the exposed ice surface looked almost black, and when on the Otrughul glacier I had under serious difficulties clambered up to an elevation of circ. 16,000 ft., the reaches of clear ice and snow descending in sharp curves from the highest buttresses of a peak over 23,000 ft. high, seemed still as far away as ever (Fig. 2). The barrenness of the valleys below was great, and the bleak steep slopes of rock or detritus told plainly the story of rapidly progressing erosion.

The melting of the glacier ice was still proceeding at a great rate, and the flooded condition of the streams was a great source of trouble and risk in the deep-cut gorges. In addition to these difficulties of nature we had to contend with much wily obstruction on the part of the few semi-nomadic hillmen and select malefactors exiled from Khotan, who form the only population in this desolate mountain region and upon whom we entirely depended for supplies, transport, and guides. Fortunately these and similar obstacles did not prevent us in the end from clearing up many interesting details of orography in the rugged ice-covered main range rising south of the Yurung-kash.

By September 9th I had returned to Khotan and after a few days I started my archæological campaign in the desert adjoining the oasis north-eastward. While surveying extensive débris-strewn areas north of Hanguya, once thickly populated and now abandoned in the desert, I had the satisfaction of recovering by excavation a mass of interesting small relievos in hard stucco, which had once decorated the walls of a large Buddhist temple dating probably from the 5–6th century A.D. Finds made here of decorated pottery were important as supplying evidence about the date of the remarkable terra-cotta grotesques which I had collected in plenty from Yotkan, the site of the ancient Khotan capital.

From the Hanguya Tati I passed on to a group of small ruined sites in the belt of sandy jungle between the still cultivated areas of the Domoko oasis and the open desert of drift sand. The site of Khadalik, from which one of my treasure-seeking guides had extracted some MS. remains of interest, seemed disappointing at first sight; for its principal ruin which soon proved to be that of a large Buddhist temple, presented itself merely as an extensive low débris heap covered with sand. But scarcely had we begun systematic clearing of it when pieces of paper MSS. began to crop out in numbers. It soon became evident that the destructive operations of those who in early days had quarried the ruined temple for timber, had failed to disturb the votive offerings of the last worshippers. So we were able to recover here in spite of the almost complete disappearance of the superstructure a large number of MS. leaves in Sanskrit, Chinese, and the "unknown" language of

Khotan, besides many inscribed wooden tablets. Plentiful remains of stucco relievoes and fresco pieces once adorning the temple walls, together with painted panels, had also found a safe refuge in the sand covering the floor. Their style pointed clearly to the latter half of the 8th century A.D. We worked hard here with a large number of diggers and practically without interruption from daybreak until nightfall. Yet it took us fully ten days to clear these temples together with some smaller adjoining shrines and dwellings.

I cannot stop to describe the interesting instances of successful fight with the desert which I noticed in certain recently opened colonies on my way to Keriya, the chief oasis of an administrative district which is mainly desert. It is a fit region for producing 'ships of the desert,' and the seven big camels which I purchased at Keriya after a great deal of sifting and testing, proved the mainstay of my transport thereafter. On archæological expeditions into the desert such as I had to conduct, the cares and difficulties about "transport and supplies" are apt to become truly forbidding. But my own brave camels from Keriya never caused me worry. They held out splendidly against all privations and hardships, and were after nearly two years' travel so fit and fine looking that when I had at last to dispose of them before my departure for India they realised over 50% profit, *i.e.*, for the Government of India.

At Niya, the last small oasis eastwards, I had to prepare rapidly for fresh exploration at the ancient site in the desert northwards, where in 1901 I had made important discoveries among ruins deserted already in the 3rd century A.D. It was pleasing to see how readily my old Niya diggers rejoined me. What with the example set by this my 'old guard' a column of 50 men with supplies for four weeks and additional camels could be raised within a single day's halt. Three rapid marches through the luxuriant jungle belt which lines the dying course of the Niya river northward, took us to the supposed resting place of that great holy warrior and martyr Iman Jafar Sadik with its quaint collections of rags, yak tails, and other votive offerings. There we left behind the last abode of the living and also the present end of the river. Two days later, I had the satisfaction of camping once more amidst the bare dunes close to the centre of that long-stretched sand-buried settlement.

A route slightly diverging from that followed on my first approach to the site had taken me past a series of ruined dwellings, rows of gaunt trunks of dead fruit trees and other signs of ancient occupation which had not been seen by me on my previous visit. The encouraging promise thus held out to us soon proved true when after tramping next morning I started our fresh diggings at the northernmost of the ruined dwellings, which lay scattered in a line some two miles to the west of the area explored in 1901 and then hidden by high dunes. The ruin we first cleared was a relatively small dwelling, covered only by 3—4 ft. of sand. As soon as the floor was reached in the western end room, Kharoshthi documents on wood began to crop out. Soon I had the satisfaction of seeing specimen after specimen of these ancient records and correspondence in Indian language and script emerge from where the last dweller, probably a petty official, about 1,700 years ago had left behind his " waste paper." My thoughts triumphantly travelled to Cambridge, where I knew my friend, Professor Rapson, was still busily engaged in the decipherment of the Kharoshthi records brought back from my first journey. Rectangular tablets, of the official type with closely fitting wooden covers serving as envelopes; oblong boards and labels of wood serving for records and accounts of all kinds, were all represented among the finds (Fig. 3). A number of the letter tablets still retained, in fact, their original string fastenings, and a few even their clay seals. How cheered I was to discover among them impressions from classical intaglios showing Eros and Heracles!

At a far larger structure, which I next cleared, wind-erosion proved to have completely destroyed the walls and any objects once left between them, though the massive posts, bleached and splintered, still rose high. But on examining the ground beneath what seemed to have been an outhouse, I realised quickly that it was made up of layers of a huge refuse heap. Of course, we dug into this unsavoury quarry, though the pungent smells which its contents emitted, even after seventeen centuries of burial, were doubly trying in the fresh eastern breezes driving fine dust, dead microbes, and all into one's eyes, throat, and nose. Our perseverance was rewarded at last by striking on a level fully 7 ft. below the surface curious sweepings of all sorts, rags of manifold fabrics in silk, cotton, felt; seals of bronze and bone; embroidered leather; wooden pens; fragments of lacquer ware, etc.; and in the midst of this dustbin, a dozen small Chinese tablets of exquisite penmanship. They were congratulatory notes addressed to members of the

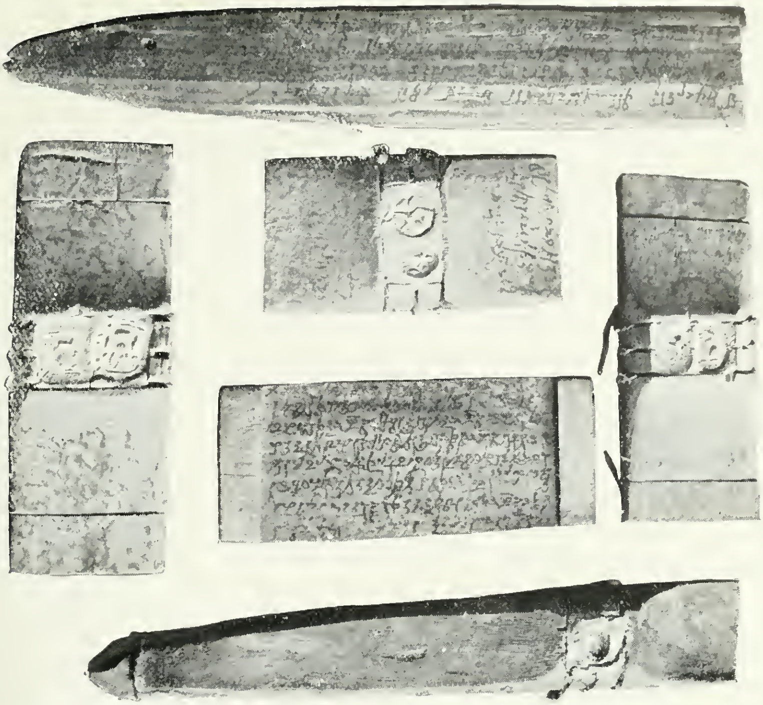


Fig. 3. Niya Site. Wooden tablets inscribed in Kharoshthi with covers and clay seals.

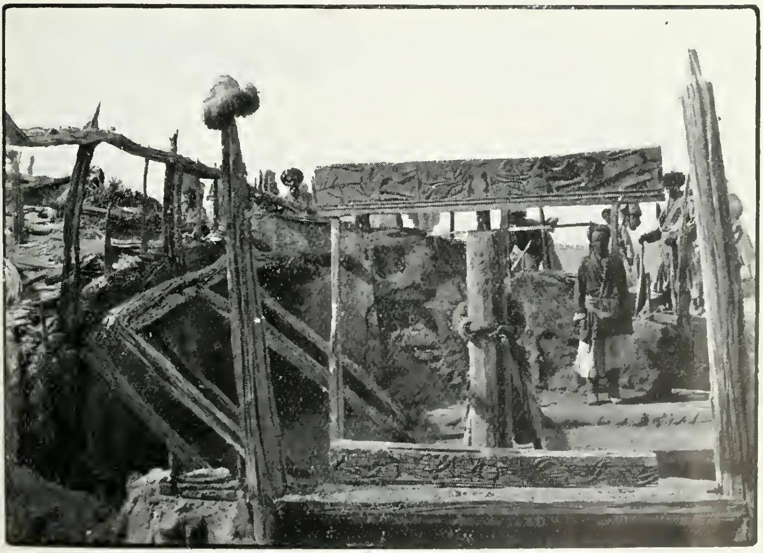


Fig. 4. Niya Site. Hall of Ancient Dwelling (Third Century A.D.) after excavation.

ruling family, and the localities mentioned in them throw interesting light on the connection maintained with distant parts on the route into China proper.

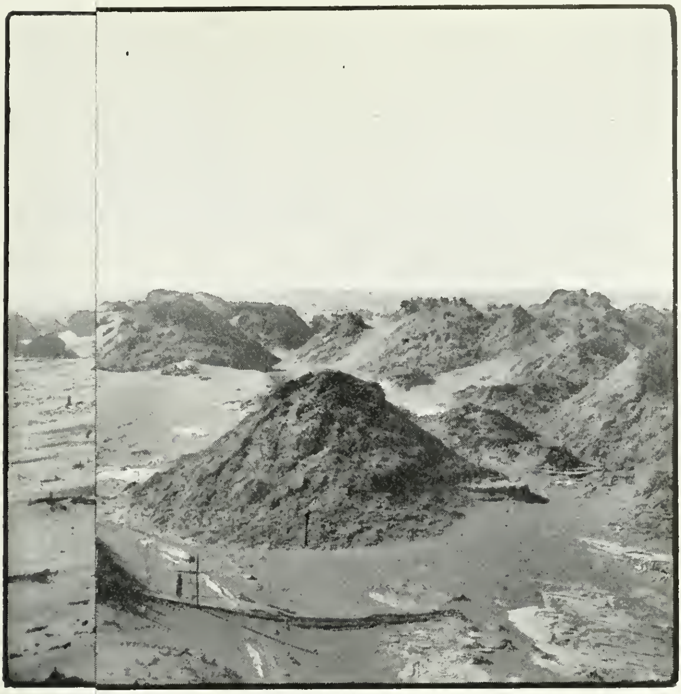
I cannot attempt to give details of the busy days spent in searching the chain of dwellings stretching southwards. Kharoshthi records on wood, whether letters, accounts, drafts, or memos, turned up in almost every one of these dwellings, besides household objects and implements illustrative of everyday life and the prevailing industries. Curious discoveries almost daily seemed to efface all sense of time; *e.g.*, when after laboriously clearing a perfectly preserved living-room, filled with 9 ft. of sand, I found that its last dweller had carefully removed all its furniture and fittings, I could not help giving vent to my feelings at such mean stinginess,—until I discovered that quite a sheaf of accounts and memos was waiting for me on the top of the high fire-place, where their pedantic owner had evidently forgotten to look for them. Though nothing of intrinsic value had been left behind by the last dwellers of this modest Pompeii, there was sufficient evidence of the ease in which they had lived, in fine wood carvings of Græco-Buddhist style, in the large number of individual rooms provided with fire-places, comfortable sitting platforms, etc. (Fig. 4). Remains of fenced gardens and of avenues of poplars or fruit trees could be traced almost invariably near these houses. Curiously enough such frail structures as rush fences seemed to have suffered least from that chief factor of destruction, wind-erosion.

I must forego any attempt at detailed description of our fortnight of exacting but fruitful work. Yet a particularly rich haul of ancient documents may claim mention. I was clearing a large residence in a group of ruins on the extreme west of the site. Fine pieces of architectural wood carving brought to light near a large central hall soon proved that the dwelling must have been that of a well-to-do person, and finds of Kharoshthi records of respectable size, up to 3 ft. long, suggested his having been an official of some consequence. The hope of finding more in his office was soon justified when the first strokes of the Ketman laid bare regular files of documents near the floor of a narrow room adjoining the central hall. Their number soon rose to over a hundred. Most of them were 'wedges' as used for the conveyance of executive orders; others, on oblong tablets, accounts, lists, and miscellaneous 'office papers,' to use an anachronism. The scraping of the mud flooring for detached pieces was still proceeding when a strange discovery rewarded honest Rustam, the most experienced digger of my 'old guard.' Rustam had just extracted between the wall and a lump of clay left there apparently by accident a well-preserved double wedge tablet, when I saw him eagerly burrowing with his hands into the floor just as when my little terrier is at work opening rat holes. Before I could put any questions I saw Rustam triumphantly draw forth from circ. 6 inches below the floor a complete rectangular document with its double clay seal intact and its envelope still unopened. When the hole was enlarged we saw that the space towards the wall and below the foundation beam of the latter was full of closely packed layers of similar documents.

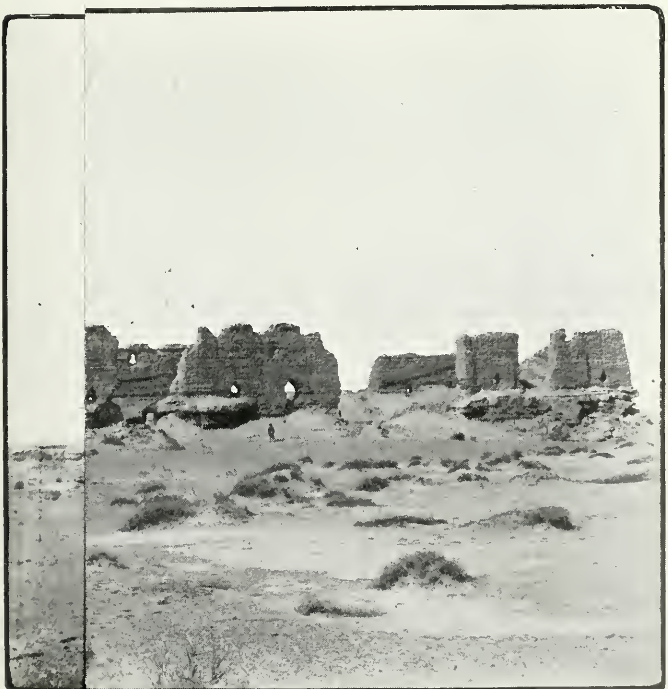
It was clear that we had struck a small hidden archive, and my joy at this novel experience was great. The fact that with a few exceptions all the rectangular documents of which fully three dozens were cleared in the end, had their elaborate string fastenings unopened and sealed down on the envelope, manifestly confirmed that these were agreements or bonds which had to be kept under their original fastening and seals in order that in case of need their validity might be safely established. The care which had been taken to hide the deposit and at the same time to mark its position showed that the owner had been obliged to leave the place in an emergency but with a hope of returning. On clearing the clay sealings at night in my tent I discovered that almost all had remained as fresh as when first impressed and that most of them were from seals of classical workmanship representing Heracles with club and lion skin; Eros; Pallas Promachos, helmetted busts, etc.

As our work proceeded to the south of the site the ruins had to be searched for amidst closely set sand cones raising their sombre heads under tangled masses of tamarisk, dead or living, to 40—50 ft. We emerged at last upon somewhat more open ground towards the southern end of the site. The ruined dwellings were small there; but an inspection of the ground near by as reproduced in the panorama (Fig. 5) revealed features of interest. Only some sixty yards from the ruin which had yielded the first tablets, there stood a square of dead mulberry trees, raising their trunks up to 10 ft. or more, which had once cast their shade over a tank still marked by a depression. The

Ancient footbridge over
dry river-bed.



ills and dunes.



ng ancient Chinese Frontier Wall.

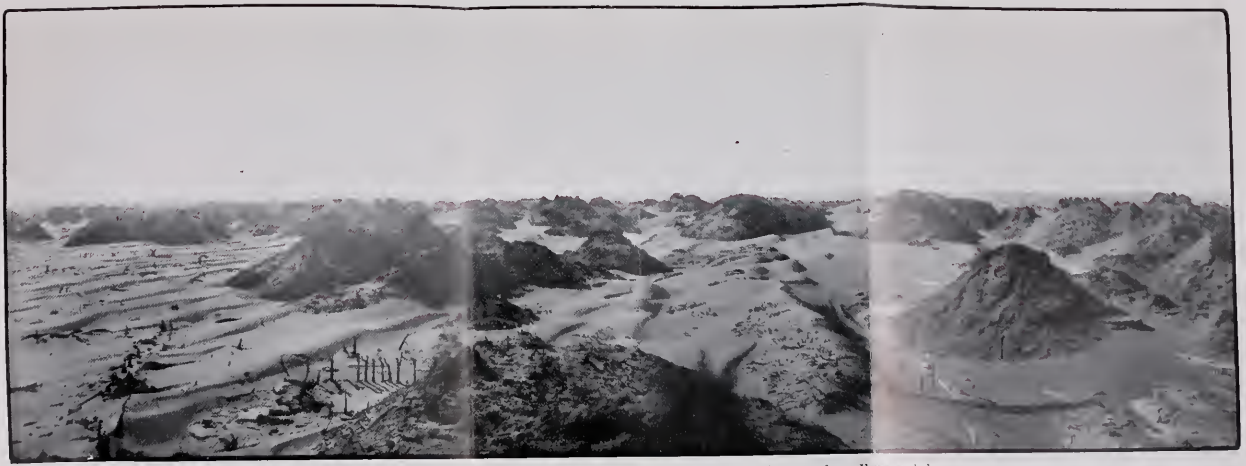

Remains of ancient orchards.
Ancient tank with dead mulberry trees.
Ancient footbridge over dry river-bed.

Fig. 5. Niya Site. Panoramic View of Ground near South end, with tamarisk covered sandhills and dunes.

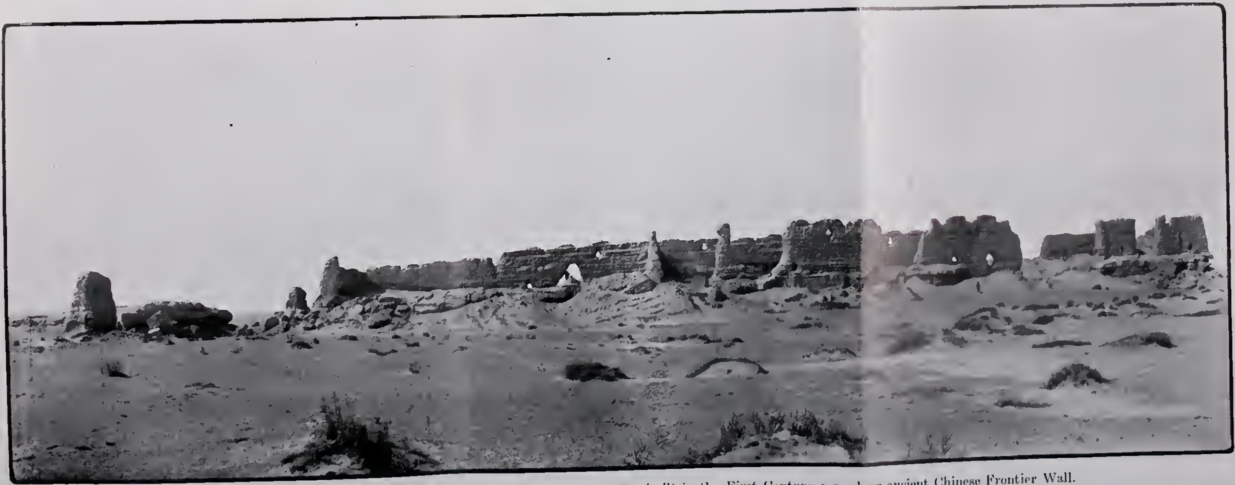


Fig. 10. Desert West of Tun-huang. Ruins of Great Military Magazine built in the First Century B.C. along ancient Chinese Frontier Wall.

stream from which the canal once feeding it must have taken off, was not far to seek; for behind the nearest ridge of sand to the west there still lay a foot-bridge about 90 ft. long, stretched across an unmistakable dry river-bed (Fig. 5). Of the trestles which had carried the bridge, two still stood upright half-buried in dunes. Beyond the left bank stretched shrivelled remains of arbours. For over two miles to the north-west we could follow the traces of the ancient river-bed in places completely covered by drift sand but emerging again amongst low dunes and patches of dead forest. Over all this strange ground dessication was written most plainly.

The four hundred odd miles of desert through which my marches took me in November from the Niya site past Charchan to Charklik, offered opportunities for interesting archæological work at more than one point. But I cannot pause to describe it.

At the small oasis of Charklik the *Lou-lan* of the old Chinese pilgrims and Marco Polo's *Lop,* the preparations for my long-planned expedition to the ruins north of Lop-nor, first discovered by Dr. Hedin on his memorable journey of 1900, proved an exacting task. Within three days I had to raise a contingent of 50 labourers for the proposed excavations; food supplies to last all of us for five weeks, and to collect as many camels as I possibly could get for the transport, seeing that we should have to carry water or rather ice sufficient to provide us all on a seven days' march across waterless desert, then during a prolonged stay at the ruins as well as on the return journey. The problem looked, indeed, formidable when I found that exhausting all local resources I could raise the number of camels only to twenty-one.

On December 11th, crossing the deep and still unfrozen Tarim, I started my desert column from the small fishing hamlet of Abdal. For one day we followed the incipient Lop-nor marshes eastwards and luckily found good ice already available in one of the fresh-water lagoons. Every available camel was loaded with big bags full of ice. The route we now struck to the N.N.E. led necessarily near the one followed by Hedin in 1900 in the reverse direction. But there was nothing to guide us, except the position of the ruins as indicated in his route map and the compass.

On the morning of the 15th of December we had left the last salt-encrusted depression with dead poplars and tamarisks behind us, and very soon after we passed into that zone of excessive erosion which constitutes so striking a feature of the northern portion of the Lop-nor desert. The succession of steep clay banks and sharply cut nullahs between them, all carved out by wind erosion and clearly marking the prevailing direction of the winds, N.E. to S.W., was most trying to the camels' feet. There could be no doubt about this ground forming part of a very ancient lake bed. Yet curiously enough we had scarcely entered it when frequent finds of flint arrow heads and other implements of the Stone Age, supplied evidence that it must have been occupied by man in prehistoric times. By this time we were already in the clutches of an icy N.E. wind, which in the middle of the following night nearly blew my tent down. With short intervals it continued during our whole stay in this region. With minimum temperatures rapidly falling below zero Fahr., it made life exceedingly trying for the next weeks.

So it was a great relief for us all when on December 17th the first great mound indicating proximity of the site was duly sighted. By nightfall I was able to pitch camp at the foot of the ruined Stupa which stands out in this weirdly desolate landscape as the landmark of the main group of ruins (Fig. 6). The excavations which I carried on unremittingly for the next eleven days, with a relatively large number of men, enabled me to clear all remains traceable at the several groups of ruins and yielded plentiful results. Among the dwellings constructed of timber and plaster walls, exactly like those of the Niya site, wind erosion had worked terrible havoc. But luckily in various places a sufficient cover of drift sand or consolidated refuse had afforded protection for many interesting relics. In a large rubbish heap, fully 100 ft. across extending near the centre of what proved to have been a small fortified station, we struck a particularly rich mine. The finds of written records, on wood and paper, also on silk, proved remarkably numerous. The majority of the records are Chinese, apparently chiefly of an administrative character.

But documents in Kharoshthi script and in Prakrit language were also numerous. Considering how far removed Lop-nor is from Khotan, this uniform extension of an Indian script and language to the extreme east of the Tarim Basin has a special historical interest. Architectural wood carvings, objects of industrial art, metal seals, etc., brought to light in considerable number, show the same close dependence on models of Græco-

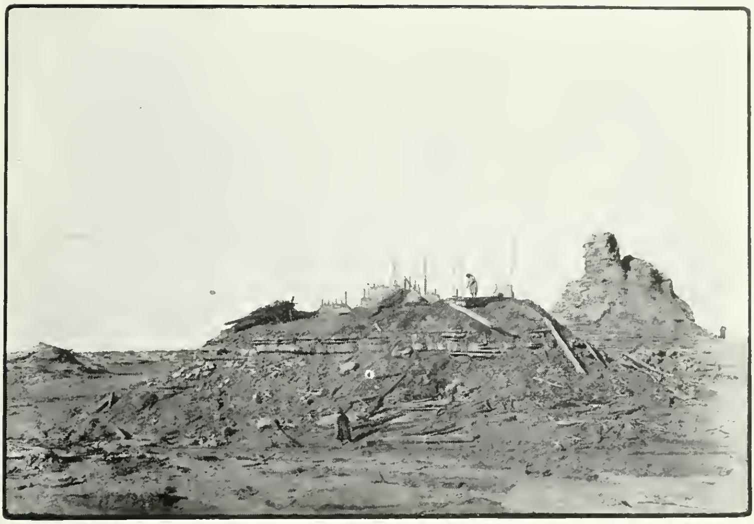


Fig. 6. Altmish-Bulak Site. Remains of Ancient Dwelling on eroded clay terrace near ruined Stupa

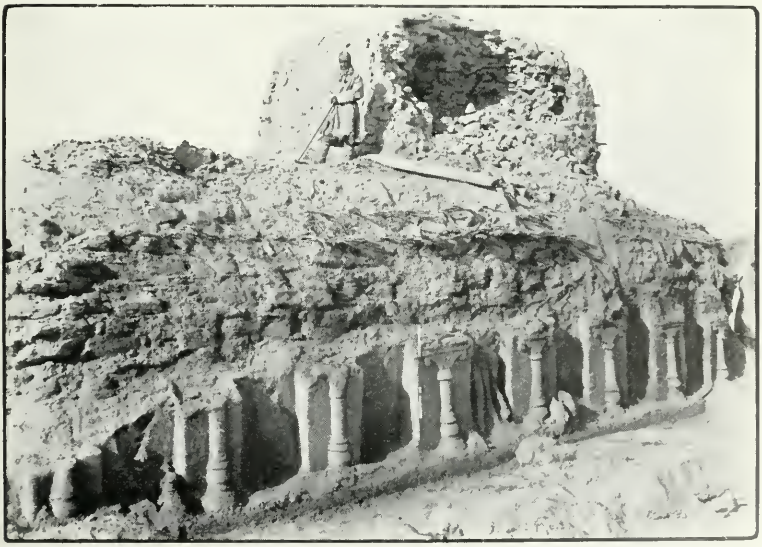


Fig. 7. Miran. Base of ruined Buddhist Shrine.

Buddhist art brought from India. Even without the evidence of dated Chinese documents and of the very numerous coin finds the art remains would have sufficed to prove that the ruins were abandoned about the same time as the Niya site, *i.e.*, the latter half of the 3rd century A.D. There were a series of indications to show that the settlement derived its importance far more from the traffic with China which passed through it than from the resources of local cultivation. Yet even allowing for this, how impressive is the evidence of the great physical changes which have overtaken this region, mainly through dessication! For over 150 miles to the east no drinkable water could be found now along the line which the route must have followed.

Our ice store was getting very low. Cases of illness among the men showed how exposure to the continuous icy blasts was telling on them. So it was just as well that by December 29th the exploration of all structural remains traceable was completed. The main camp in charge of the Surveyor was sent back to Abdal, while I set out with a few men through the unexplored desert south-westwards. It was an interesting though somewhat trying tramp, which after seven days brought us safely to the ice of the Tarim lagoons. Progress was far more difficult than on the journey from Lop-nor owing to the steadily increasing height of the ridges of drift sand we encountered. The rows of dead trees marking the banks of ancient lagoons or river courses disappeared here soon. The resulting difficulty about fuel was a serious matter for us, considering that just then we experienced the lowest temperature of the winter, down to 48 degrees below freezing point. Relics of the Stone Age, including a fine jade axe, cropped up here too on the rare patches of eroded bare ground.

I hurried via Charklik to resume excavations at Miran. This, too, was a very desolate spot situated at the foot of the absolutely barren gravel glacis which stretches down from the mountains towards the western-most portion of the Lop-nor marshes. None of our party is ever likely to forget the misery we endured during those three weeks of hard work from the icy gales almost always blowing. There were days when all my assistants were on the sick list with the exception of bright, alert Chiang-ssu-yïeh. But the results achieved offered ample reward to me. The ruined fort quite fulfilled the promise held out by the first experimental digging. The rooms and half under-ground hovels which had sheltered its Tibetan garrison during the 8th—9th century A.D., were rough enough in design and construction, but proved to contain in some respects the most remarkable refuse accumulations it has ever fallen to my lot to clear. Rubbish filled them in places to a height of 9—10 ft., and right down to the bottom the layers of refuse of all sorts left behind by the occupants yielded in profusion records on paper and wood, mostly in Tibetan but some in the earliest Turki writing. The total number rose in the end to close on a thousand. Similarly the remains of implements, articles of clothing, arms, etc., were abundant. But I must add also, for intensity of absolute dirt and age persisting "smelliness" I shall always put the rich 'castings' of Tibetan warriors in the front rank.

There can be doubt that the stronghold was intended to guard the direct route from the southern oases of the Tarim Basin to Tun-huang (or Sha-chou). But older in date and of far wider interest were the art remains which we brought to light from the débris mounds of some Buddhist shrines surviving erosion in the vicinity of the fort (Fig. 7). These must have been in ruins at least four centuries before the Tibetan occupation led to the erection of the fort. From one of them emerged remnants of colossal stucco relievos representing seated Buddhas. The influence of classical art was reflected with surprising directness in the much damaged yet remarkable frescoes which covered what remains of the walls of two circular domed temples enclosing small Stupas. Some of the frescoes were so thoroughly Western in conception and treatment that when they first emerged from the débris I felt tempted to believe myself rather among the ruins of some Roman villa in Syria or Asia Minor than those of Buddhist sanctuaries on the very confines of China. Kharoshthi inscriptions painted by the side of some frescoes indicate the 3rd century A.D. as the approximate date when these temples were deserted.

From Abdal a large caravan entrusted to two veteran Turki servants was to take my finds back to Mr. Macartney's care at Kashgar. Then on February 21st, 1907, I started on the long desert journey from the dreary Lop-nor marshes right through to Tun-huang on the westernmost border of Kan-su and China proper. It was the same route by which Marco Polo had travelled "through the desert of Lob." Six centuries before him it had seen a traveller scarcely less great, Hsüan-tsang, the pilgrim of pious memory, returning to China laden with Buddhist relics and sacred books after many years' wanderings in the "Western Regions." Ever since the end of the 2nd century B.C., when the Chinese first brought the Tarim Basin under their political influence, this desolate desert track close on 350 miles in length had served as an important caravan route during successive periods, only to be forgotten again when Chinese power westwards weakened or a policy of rigid seclusion strangled trade. Some twenty-five years ago it had thus to be re-discovered.

The seventeen long marches in which we accomplished the desert journey, still ordinarily reckoned as in the days of Marco at 28 stages, offered plentiful opportunities for interesting geographical observations. But to these there is no time to refer here.

At a point still five long marches from the edge of the Tun-huang oasis I first sighted remains of ruined watch-towers and soon came upon traces of an ancient wall connecting them. A lucky chance rewarded already the first scraping of the ground near a watch-tower with relics of manifest antiquity, and a variety of archæological indications rapidly gathered as we passed onwards, made me feel convinced that these ruins belonged to an early system of frontier defence corresponding in character to the extant 'Great Wall' on the Kan-su border. So after the shortest possible halt at Tun-huang I returned to the still wintry desert in order to explore this ruined *limes* in detail. It proved a fascinating and fruitful task, but also one of uncommon difficulty.

No information whatever could be obtained at Tun-huang about the ruins, though the educated Chinese officials there all took a very friendly interest in my work, and would have been ready enough to help us. So all the tracking of the ancient wall, often completely effaced for miles and frequently crossing most deceptive ground, had to be done by myself. Still more serious was the trouble about adequate labour for excavations. Yet by moving first to the north of the oasis and subsequently striking the ancient *limes* by a new route right through the desert west of Tun-huang, we succeeeded in the course of two months in accurately surveying its line all the way from An-hsi to its westernmost point, a distance of some 140 miles, and in exploring the ruins of all watch-stations, sectional head-quarters, etc.

The fine massive watch-towers, usually rising at intervals of 2—3 miles along the wall, were my best guides in tracking the line (Fig. 8). Almost invariably I could trace near them ruins of the modest quarters which had sheltered the detachments echelonned along the wall. From the Chinese records, mostly on wood or bamboo, which the excavations of almost every ruin yielded in plenty, I soon made certain that this frontier line dated back to the end of the 2nd century B.C., when Chinese expansion into Central Asia first began under the emperor Wu-ti. Exactly dated documents commencing with the year 99 B.C., showed that the regular garrisoning of the border wall continued throughout the first century B.C. and probably for the greatest part of its length down to the middle of the 2nd century A.D. The main purpose of this *limes* was undoubtedly to safeguard the territory south of the Su-lo ho river, which was indispensable as a base and passage for the Chinese military forces, political missions, etc., sent to the Tarim Basin. It is equally certain that the enemy whose irruptions from the north had to be warded off were the Hsiong-nu, the ancestors of those very Huns who some centuries later threatened Rome and Byzantium.

The very character of the ground through which the fortified frontier line ran from An-hsi westwards, almost all of it already in ancient times a real desert, had presented exceptionally favourable conditions for the preservation of antiques. So it was natural enough that the hundreds of inscribed pieces of wood, bamboo, silk, the remains of clothing, furniture, and equipment, which the successive occupants of these desolate posts had left behind as of no value, should have survived practically uninjured. Sometimes a mere scraping on the surface sufficed to disclose rubbish heaps in which files of wooden records thrown out from the office of some military commander before the time of Christ, lay amongst the most perishable materials, straw, bits of clothing, etc., all looking perfectly fresh. The Chinese documents, of which I recovered in the end over two thousand, refer mainly to matters of military administration, often giving exact details as to the strength, movements, etc., of the troops echelonned along the border; their commissariat, equipment, and the like. More curious still are private letters addressed to officers, full of quaint actualities, family news from their distant homes, etc. The careful study of these miscellaneous records together with

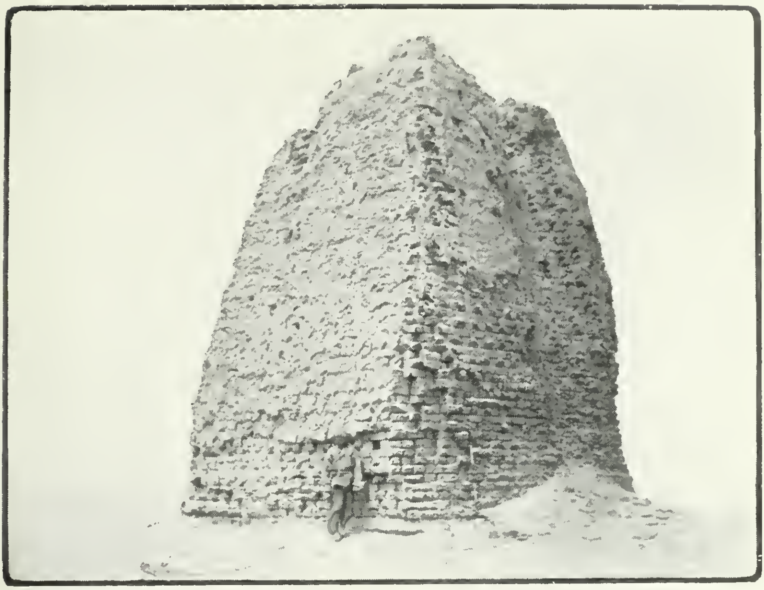


Fig. 8. Desert West of Tun-huang. Ruined Watch Tower on Ancient Frontier Line.

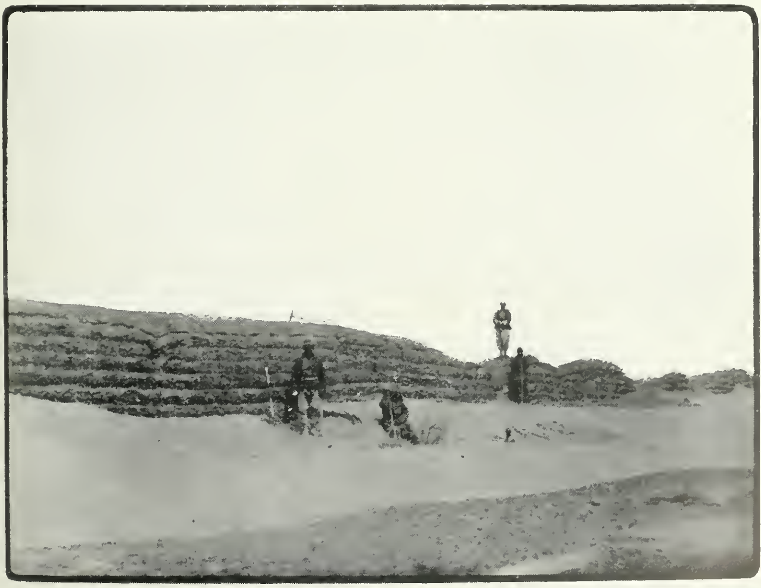


Fig. 9. Desert North of Tun-huang. Remains of Ancient Frontier Wall (built at close of Second Century B.C.)

that of the actual remains of quarters, furniture, arms, etc., will suffice to restore an accurate picture of the life led along this most desolate of borders. But in addition to this evidence, I recovered very interesting relics of the traffic from the distant west in the form of silk pieces inscribed with Indian Karoshthi and Brahmi, and in a number of letters on paper found carefully fastened, containing writing in an unknown script resembling Aramaic. This on its recent decipherment has proved to contain the earliest form of Soghdian, the Iranian language once spoken in Western Turkestan.

The construction of a regular defensive line across so extensive a stretch of desert, bare of all resources, must have been a difficult task, and it was interesting to find again and again evidence of the skill with which the old Chinese engineers had attacked it. Guided by a sharp eye for all topographical features, they had cleverly used the succession of salt marshes and lakes to supplement their line by these natural defences. For the wall itself they had had recourse to materials which though of little apparent strength were particularly adapted to local conditions. Between layers of stamped gravel, about one foot each, they interposed carefully secured rows of fascines about as high, made of neatly cut and strongly tied bundles of reeds, which were obtained from the marshes (Fig. 9). The salts contained everywhere in the soil and water soon gave to the strange rampart thus constructed a quasi-petrified consistency, which in such a region could well hold its own against man and nature—all forces in fact but that of slow grinding but almost incessant wind erosion. Again and again I noted in the course of my surveys how well preserved the wall rose along those sections which lay parallel to the prevailing direction of the winds, while where the line lay across it and in any way barred the progress of driving sand wind erosion had badly breached or completely effaced the rampart. The winds which now blow over this desert with remarkable violence and persistence, come mainly from the east and north-east.

The wall shows everywhere a uniform thickness of eight feet and still rises in places to over ten feet: But that its builders knew how to make greater efforts where needed in spite of all difficulties about labour, materials, etc., is proved by watch-towers rising in one solid square mass to heights of thirty feet or more. One small fort, marking probably the position of the gate station of *Yü-mên*, long vainly sought for by Chinese antiquaries, showed high and solid walls of stamped clay fully 15 ft. thick. Still more imposing is a solid block of halls, nearly 500 ft. long (Fig. 10), which at first puzzled me greatly by its palace-like look and dimensions, until finds of dated records of the 1st century B.C. near by proved that it had been constructed as a great magazine for the troops garrisoning the line or passing along it.

I might talk for hours about the strange observations and experiences which in the course of those fascinating months made me forget as it were the lapse of long ages. One touch must suffice here. More than once as I sat in the evening amidst the débris of some commanding watch-station, the slanting rays of the sun showed up quite clearly a curiously straight furrow-like line keeping parallel to the wall and about twenty feet within it, wherever there was a well-preserved stretch of it. Repeated examination proved that it was a shallow but well-defined track worn into the fine gravel soil by the patrols and others who had tramped along here for centuries.

We suffered a great deal from the almost daily gales and the extremes of the desert climate. On April 1st I still registered a minimum temperature of 39 degrees below freezing point. But before the month was ended the heat and glare had already become very trying, and whenever the wind fell perfect clouds of mosquitoes and other insects would issue from the salt marshes, near which we had to camp for the sake of the water, to torment men and beasts. Another source of trouble was the saltiness of the water. When the excavations had been completed, by the middle of May, it was high time to return to the oasis.

An important archæological task made me doubly eager to return to Tun-huang. Already in 1902 my friend, Professor L. de Lóczy, the distinguished head of the Hungarian Geological Survey, had called my attention to the sacred Buddhist grottoes, known as the "Halls of the Thousand Buddhas," to the S.E. of Tun-huang, which as a pioneer of modern geographical exploration in Kan-su he had visited as early as 1879. My first flying visit to the sacred caves carved into the precipitous conglomerate cliffs at the mouth of a barren valley some twelve miles to the S.E. of the oasis, had shown me a wealth of art treasures waiting for closer study. There were hundreds of grottoes large and small honey-combing in irregular tiers the sombre rock faces, and almost all of them had on their plastered walls a profusion of beautiful and more or less well-preserved frescoes (Fig. 11). In composition and style they showed closest affinity to the remains of Buddhist pictorial art as transplanted from India. The stucco sculptures in these grottoes were equally plentiful; but much of this statuary in friable stucco had evidently suffered both from the hands of iconoclasts and the zeal of pious restorers (Fig. 12).

Plentiful antiquarian evidence proved beyond all doubt that a very great portion of the shrines and art relics belonged to the period of the T'ang dynasty (7th to 9th century A.D.) when Buddhism had greatly flourished in China. The vicissitudes of the succeeding period had sadly diminished the splendour of the temples and the numbers of the monks and nuns established near them. Yet in spite of all changes and devastations Tun-huang had evidently managed to retain its traditions of Buddhist piety down to the time of Marco Polo and in a fashion even to the present day.

I know well, therefore, that my archæological activity at the cave temples, as far as frescoes and sculptures were concerned, would by every consideration of prudence have to be strictly platonic. Yet when by May 20th I established myself for a prolonged stay in camp at the sacred site I confess, what kept my heart buoyant were secret hopes of another and more substantial kind. Already two months before I had heard vague rumours about a great hidden deposit of ancient MSS. which had been accidentally discovered by a Taoist monk about two years earlier while restoring one of the temples. The trove was jealously guarded in the walled-up chapel where it was originally discovered.

The Taoist priest who had come upon, and taken charge of it, proved a very quaint person, as ignorant of what he was guarding as he was full of fears concerning gods and men. He was at first a difficult person to handle. Our success in the end was, apart from Chiang's tactful diplomacy, due mainly to what the priest was prepared to accept as a special interposition on my behalf of my Chinese patron saint, the great Hsüan-tsang. Already the fact of my well-known attachment to the memory of the saintly traveller had been helpful; for curiously enough the Tao-shi, though poorly versed in, and indifferent to, things Buddhist, was quite as ardent an admirer in his own way of "T'ang-sên," the 'great monk of the T'ang period,' as I am in another. It is true, the fantastic legends which have transformed Hsüan-tsang in popular belief into a sort of saintly Munchhausen and which accounted for the Tao-shi's worship, are not to be found in the great pilgrim's genuine Memoirs. But why should that little difference matter? When the first specimens which we at last prevailed upon the priest to pick up from the hidden MS. store and show us in secret, proved by mere chance to be fine rolls of paper containing Chinese versions of certain Buddhist texts, which the colophons declared to have been brought from India and translated by Hsüan-tsang the priest, and even my zealous Secretary were greatly impressed by the portent. Was it not Hsüan-tsang himself, so Chiang declared, who had at the opportune moment revealed the hiding place of that MS. hoard in order to prepare for me, his disciple from distant India, a fitting antiquarian reward on the westernmost confines of China proper?

Under the influence of this quasi-divine hint the Tao-shi then summoned up courage to open before me the rough door closing the entrance which led from the side of the broad front passage of his temple into the rock-carved recess, and which previous to accidental discovery through a crack, had been hidden behind a frescoed wall. The sight of the small room disclosed was one to make my eyes open wide. Heaped up in layers, but without any order, there appeared in the dim light of the priest's little oil lamp a solid mass of MS. bundles rising to 10 ft. from the floor and filling, as subsequent measurement showed, close on 500 cubic feet. The thick rolls of paper, about 1 ft. high, which turned up first, contained Chinese Buddhist texts in excellent preservation, and yet showing in paper, arrangement, etc., unmistakable signs of great age. Soon I lighted on the reverse of a Chinese roll upon an extensive text in a cursive form of Indian Brahmi script and felt relieved of all doubt. Here was indisputable proof that the bulk of the MSS. deposited went back to the time when Indian writing and some knowledge of Sanskrit still prevailed in Central-Asian Buddhism. All the MSS. were manifestly preserved exactly in the same condition they were in when deposited. Nowhere could I trace the slightest effect of moisture.

How grateful I felt for the protection thus afforded when on opening a large packet I found it full of fine paintings on silk and linen, ex-votos in all kinds of silk and brocade, with a

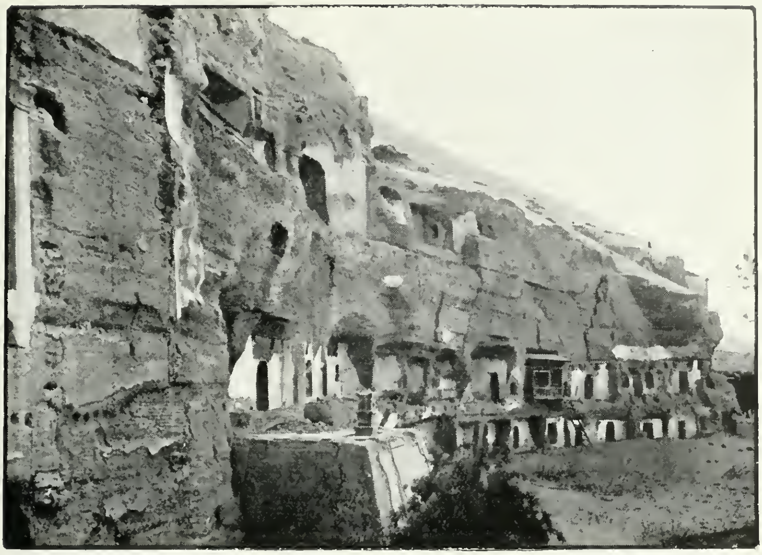


Fig. 11. "Halls of the Thousand Buddhas," Southern Series of Cave Temples.

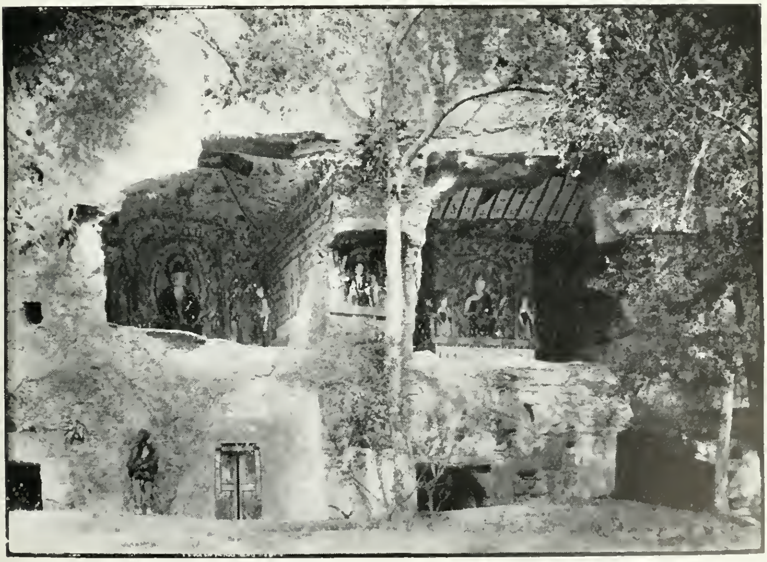


Fig. 12. "Halls of the Thousand Buddhas," Cave Temples with Frescoes and Sculpture.

miscellaneous mass of paper pictures; streamers in various fabrics; fragments of embroidered materials, etc. The silk and linen paintings had served as temple banners and were found neatly rolled up. When unfurled they displayed beautifully painted figures of Buddhas and Bodhisattwas, either quite Indian in style or else illustrating in a very interesting fashion the adaptation of Indian models to Chinese taste. It was not long before Chiang-ssu-yieh had discovered dedicatory legends with dates of the 9th and 10th century A.D. My main care was how many of these delicate graceful paintings I might hope to rescue from their dismal imprisonment and the risks attending their present guardian's careless handling. To my surprise and relief he attached little value to these fine art relics of the T'ang times. So I could rapidly put aside "for further inspection" the best of the pictures.

It is impossible for me to describe here how the search was continued day after day without remission, or to indicate all the interesting finds with which this curious digging was rewarded. It was particularly the bundles filled with miscellaneous texts, painted fabrics, papers of all sorts, which yielded in plenty important finds of Buddhist MSS. in Indian and other non-Chinese languages. One of the most important among them was a large and remarkably well-preserved Sanskrit MS. on palm leaves, apparently written earlier than any so far known Sankrit MS. Tibetan texts, both in form of big rolls and Pothis, were abundant. Also old Uighar MSS. and block printed books cropped up in various miscellaneous bundles. Runic Turki, too, and even the peculiar form of Syriac script usually employed for Manichæan writings were represented.

Less attractive at first look, but in reality of particular antiquarian value, were the miscellaneous records in Chinese such as letters, monastic accounts, etc., which filled those bundles of apparent "waste paper." The plentiful dated documents found among them soon enabled me to determine that the walling up of the chamber must have taken place about 1000 A.D. There can be little doubt that the fear of some destructive invasion had prompted the act. But the well sheltered small cave had in all probability served for a long time previously as a place of deposit for objects far more ancient. The partial examination of our Chinese collection which became possible a year later disclosed in fact among it quite a series of MSS., showing exact dates which extend certainly as far back as the 3rd century A.D. But it will yet need protracted scholarly labours before the time of the earliest pieces can be definitely established.

I need not attempt to relate here all the difficulties which had to be overcome in the course of this strange digging and before the 'selections for closer study,' as our polite convention styled them, could be secretly transferred to my improvised store room without any one, even of my own men, having received the slightest inkling. Enough that in the end the worthy Tao-shi became almost ready to recognise that I was performing a pious act in rescuing for Western scholarship those relics of ancient Buddhist literature and art which otherwise were bound to get lost earlier or later through local indifference. But my time for feeling true relief came when all the twenty-four cases heavy with the MS. treasures rescued from that strange place of hiding and the five more filled with paintings, embroideries and similar art relics from the same cave had safely been deposited in London.

The strain of those labours had been great. So by the end of June I felt heartily glad to exchange archæological work in the torrid desert plains for geographical exploration in the Western and Central Nan-shan. After leaving my collections in the safe keeping of the Yamen at An-hsi, I moved towards the great snowy range south which forms the watershed between the Su-lo-ho and the river of Tun-huang. On my way there I discovered a large ruined site near the village of Chiao-tzu, between the lowest two of the barren outer ranges. Archæological evidence showed that the walled town must have been occupied up to the 12th–13th century A.D. All the more striking was the proof which its walls afforded of the effects of wind erosion since that period. In spite of a very massive construction all lines of walls facing east have been completely breached through the driving and scouring sand, and in many places practically effaced, while the walls facing N. and S. and thus lying parallel to the direction of the prevailing east winds, have escaped practically uninjured. When I subsequently ascended the cañon-like valley in which the stream of Ta-shih cuts through the second outer range I came upon very picturesque series of Buddhist cave temples, known as *Wang-fu-hsia*, the Valley of the 10,000 Buddhas, and still forming a pilgrimage place. In character and date they showed close affinity to the 'Halls of the Thousand Buddhas' (Fig. 13).

After surveying the great chain of glacier-crowned peaks which overlook the terribly barren detritus plateaus of the Nan-shan west of the Su-lo-ho we made our way through a hitherto unexplored mountain tract to the famous Chia-yü-kuan Gate of the still extant Great Wall. Here I succeeded in clearing up an archæological problem of considerable historical interest. It concerns the relation which this wall, hitherto believed to end at Chia-yü-kuan, bears to the ancient defensive border line I had discovered to extend into the desert over 300 miles further west.

At Su-chou, the first town within the Wall, I had to overcome considerable difficulties before we could start by the close of July on our expedition into the Central Nan-shan. The local authorities were full of apprehensions about attacks of Tangut robbers, etc., and generally the Chinese settlers of the Kan-su oases are swayed by a perfect dread of the mountains which to them remain a *terra incognita* beyond the outermost range. We could obtain guides only as far as the broad plateau-like valley between the Richthofen and To-lai-shan ranges where we found gold pits at an elevation of circ. 13,000 feet. After leaving these exposed mining camps where the snow had just melted we did not sight human beings until towards the close of the month we came upon a few Mongols grazing in the valleys south of Kan-chou. Fortunately the well defined character of the four great ranges in which the Nan-shan rises towards the uplands of the Khara-nor and Koko-nor region (Fig. 14) made the want of all guidance less serious. The excellent grazing met with almost everywhere at elevations between 11,000 to 13,000 feet was a great boon for our hard-tried animals. But we all suffered a great deal from almost daily downpours of icy rain and sleet, and the trouble arising from the extensive bogs we encountered at the head of the great valleys and even on the broad watershed plateaus. The natural difficulties were increased very considerably by the helplessness of our Chinese pony-men and what I may politely call their deep-rooted physical aversion from taking risks. Now these dreaded mountains were to them full of risks, imaginary as well as real, and instead of using such intelligence as plentiful opium smoking had left them to guard against these they tried their best to run away from them altogether. Again and again they made organized attempts at desertion which threatened to leave us without transport, but luckily could be suppressed without frustrating our plans.

By marches aggregating to over 400 miles we managed during August to cross and survey in detail the three northernmost ranges of the Central Nan-shan, all rising to snowy peaks of 18,000 to 19,000 feet, between the longitudes of Su-chou and Kan-chou. In the course of these surveys all rivers descending to the oases as well as the Su-lo-ho were explored to their glacier-fed sources. The magnificent ice-crowned range which divided the head-waters of the Su-lo-ho from the Khara-nor and Koko-nor drainage, proved to rise both in height of individual peaks (probably up to 21,000 feet) and of crest-line considerably above the northern ranges. From the wide mountain-girt basin of the Su-lo-ho sources we made our way over bog covered uplands to the head-waters of the Ta-tung river, where we touched the Pacific drainage. Thence we regained the upper valley of the Kan-chou river and finally effected our passage through the Richthofen range over a succession of high transverse spurs. The total mountain area covered by Ram Singh's Plane Table Survey, between An-hsi and Kan-chou, amounted to close on 24,000 square miles.

From Kan-chou I started early in September on the long journey which was to take me back to the Tarim basin for my second winter campaign. Several considerations, archæological as well as practical, obliged me to follow on this journey the great caravan route via Hami and Turfan, which since the 7th century A.D. has supplanted the more ancient route past Lop-nor. At An-hsi Rai Ram Singh, whose health had proved unequal to the hardships of a second winter's work in the desert, was relieved by Surveyor Rai Lal Singh, who subsequently gave splendid proofs of his exceptional zeal and fitness for surveying work under trying conditions.

Of the long journey commenced early in October, 1907, and covering close on 900 miles marching distance, which took me within about two months from An-hsi to Kara-shahr I cannot pause to give details here. I devoted some time to visits of important ruined sites which had been largely explored by successive expeditions of Professors Grünwedel and Von Lecoq under the auspices of the Prussian Government.

On reaching Kara-shahr early in December I lost no time in setting the spade to work.

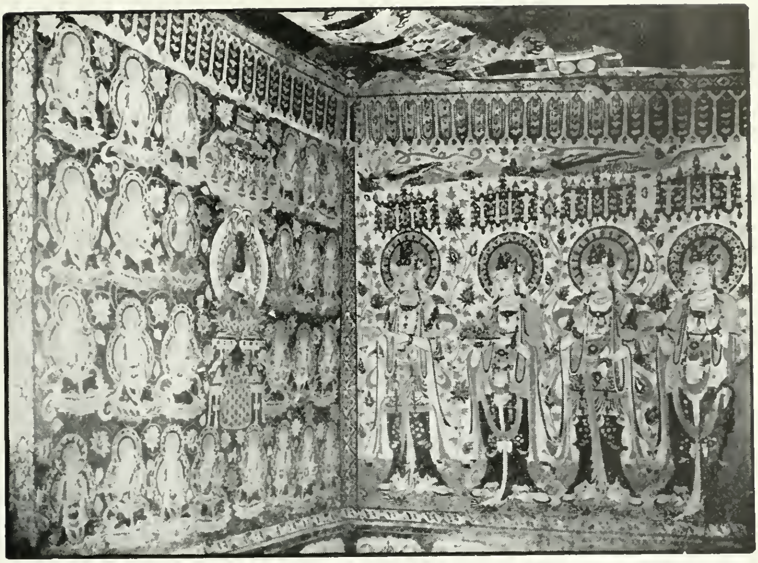


Fig. 13. "Valley of the Ten-thousand Buddhas," Frescoed Wall in Cave Temple.

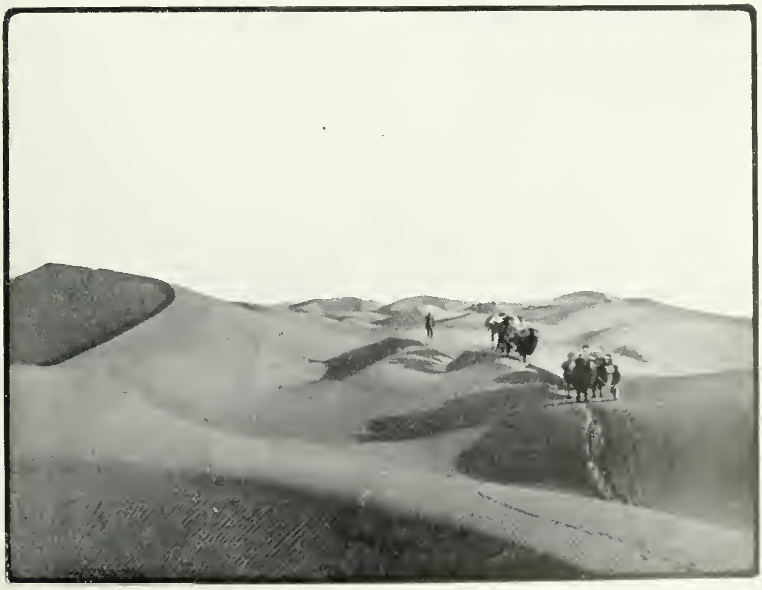


Fig. 15. Taklamakan Desert, Crossing High Dunes towards Keriya River end.

A fair field for systematic excavations was offered by an extensive collection of ruined Buddhist shrines, known to the local Muhammadans by the name of Ming-oi, 'The Thousand Houses,' which dot some low rock terraces jutting out from the foot of the hills one march to the west of Kara-shahr. In spite of all the destruction due to iconoclastic zeal and atmospheric influences plentiful archæological spoil rewarded our diggings here. The deep débris layers filling the interior of the larger shrines yielded a great quantity of excellent relievo sculptures in stucco once adorning the temple walls. From vaulted passages enclosing some cellas we recovered fine fresco panels which a timely burial had saved both from fire and moisture. Of the lavish adornment with votive gifts which these shrines once enjoyed there survived evidence in finds of painted panels and delicately carved relievoes once richly gilt.

During the fortnight spent at Ming-oi we worked under quite Sarmatic conditions. Minimum temperatures down to 42 degrees below freezing point I should, perhaps, not have minded so much, had we only been saved those icy vapours sent forth by the great Bagrash Lake south which enveloped ruins and camp like a white fog and did not lift for days. So it was a great relief for us all to move up to the cold but sunny mountains of Khora, where information elicited with much trouble from reticent Mongol shepherds led to the discovery of Buddhist remains hitherto unnoticed.

The New Year of 1908 found us at Korla where close to the north-east end of the great sandy desert I felt the satisfaction of having returned once more to my own ground.

From there Lal Singh and myself made our way by different routes through unsurveyed desert to the ancient oasis of Kuchar on the great caravan route north-westward. After a rapid survey of the interesting ruins close by I was free towards the close of January to resume my journey towards the south of the great desert. Enquiries set on foot by me since leaving the Khotan and Keriya region in 1906 had resulted in information reaching me about several ruined sites in the Taklamakan which had remained unexplored, and I was anxious to visit them before the heat and sand-storms of the spring made work on that ground impossible. A march due south from Kuchar through the Taklamakan to where the Keriya river dies away in the sands, was beset with serious difficulties and possible risks. But Hedin's pioneer journey of 1896 showed that it was practicable under certain conditions, and as there were ruins to be visited near the Keriya river course I decided to try the 'short cut' and thus to save time. I could not disguise to myself the risks to be faced with a relatively large caravan. While Hedin coming from the south had left the end of the Keriya river with the certainty of striking the broad goal of the Tarim right across his route at some point or other, our hope of reaching water within reasonable time depended solely on our steering correctly across some 150 miles of high dunes, towards a particular point, and on the assumption that the Keriya river still actually sent its waters there.

On January the 29th we left the last shepherd huts on the Tarim with a party counting altogether twenty men and food supplies to last one month and a half. After a trying tramp of eight days over dunes rising often to 100 feet and more (Fig. 15) we reached the northern edge of the dried-up delta which the Keriya River had formed at some ancient period. It presented itself as a perfect maze of dry river-beds all half buried under drift-sand and often completely disappearing amidst thick jungle of trees and scrub dead for long ages. Here our real trouble began: it was as if after navigating an open sea we had reached the treacherous marsh coast of a tropical delta without any light-houses or land-marks to guide us into the right channel. Nowhere on my desert travels have I met ground so confusing and dismal. Attempts to dig wells failed again and again. The hearts of the men except my brave Surveyor Lal Singh, and a few of my old followers were sinking lower and lower. When five more weary marches had passed without bringing us to water the increasing alarm of the Shahyar men became a cause of serious concern. Thought of flight was ever tempting them to what was bound to prove destruction. On the sixth day at last the view from a huge sand ridge of some 300 feet in height revealed in that vast expanse of grey and yellow bleakness a few strange streaks of white. It was the glittering ice sheet of the river, and the relief was intense when after a long tramp eastwards we arrived at it—and were sure that it was not merely some salt-encrusted marsh bed. It was time for us all to reach the river. The camels had tasted no water for fully a fortnight. We humans had been rationed for the same time to the scanty allowance of about one pint per diem and man. The ever errant river had formed a new bed at a considerable distance to the west of the one where Hedin had seen it, and the sands through which it now flowed were still absolutely sterile. It took several days more before we arrived at living forest.

After a day's rest I could resume archæological labour at the Kara-dong site which the river by its latest change has approached again after long centuries. Since my first visit in 1901 the shifting of dunes had laid bare ruined dwellings then too deeply buried beneath the sand. Their excavation now furnished definite antiquarian evidence that a small agricultural settlement had existed here far away in the desert during the first centuries of our era. But neither of the excavations here, nor of the more fruitful ones carried out in the desert belt north of the Keriya-Khotan route, can I find time to give an account here.

About the middle of April I set out again northward from Khotan by the desert route which leads to Aksu along the Khotan river-bed, then practically dry. While following it I had the satisfaction of discovering on the curious desert hill of Mazar-tagh, the ruins of a fort once guarding the route, and of recovering from the huge masses of refuse on the steep rocky slopes below a great collection of documents on wood and paper, in a variety of scripts, and none apparently later than the 8th and 9th centuries A.D.

From Aksu I made my way across barren and yet remarkably picturesque ranges previously unsurveyed, to the little-known oasis of Kelpin. Opportunities for historically interesting observations about progressive desiccation abounded both in this now sadly arid hill region and in extensive débris areas marking ancient settlements, which I subsequently traced in the desert towards the lowest course of the Kashgar river.

But the increasing heat and the thought of the many heavy tasks still before me obliged me to return now by rapid marches to Khotan. Then followed in the shelter of my favourite old garden palace at Khotan six weeks of constant toil, absorbed entirely by the sorting and packing of my archæological collections. Never, perhaps, has the ancient oasis seen such making of cases, tinning, etc., as went on in the courtyards of my old palace during those long hot weeks.

Before the end of July my energetic Surveyor, Lal Singh, rejoined me from surveys in the Tien-shan, and on August 1st I was able at last to despatch my heavy convoy of antiques, making up fifty camel loads, safely to the foot of the Karakoram passes where it was to await me. I myself started with Lal Singh on my long-planned expedition to the sources of the Yurung-kash river. My previous explorations in the Karanghutagh region had convinced me that the Yurung-kash headwaters were quite inaccessible from the West. So a fresh effort was now to be made to penetrate into that wholly unexplored mountain region from the East.

The difficulties began early when we made our way through the terribly confined gorges above Polur to the northernmost high plateau (circ. 15,000 feet above the sea) adjoining the outer main Kun-lun range. There we had the good fortune to fall in with a small party of Yak hunters from Keriya, one of whom, Pasa, a wily but experienced fellow, could after much trouble be prevailed upon to show us a track to the uppermost Yurung-kash gorge. We reached under his guidance first the deep-cut valley of Zailik. There we found extensive gold pits evidently worked for long ages. In the old days when the digging was carried on by forced labour, this terribly rugged gorge with its inclement climate must have seen more human misery than one cared to think of. Forbidding as this valley of Zailik is, its discovery proved to us of great value. We managed to ascend from it a series of high spurs coming straight down from the main Kun-lun range northward, and by establishing survey stations close under its crest line to map with theodolite, plane table and photographic panoramas, the greater portion of the inexpressibly grand and wild mountain system containing the headwaters of the Yurung-kash. On the south for a distance of over 60 miles we could see them flanked by a magnificent range of snowy peaks, some rising to over 23,000 feet, and all clad with glaciers more extensive than any I had so far seen in the Kun-lun.

By crossing a succession of side spurs over passes 17,000 to 18,000 feet high and subsequently ascending the extremely confined gorge of the main river we penetrated after eight trying marches to the great glacier-bound basin, circ. 16,000 feet above the sea, where the easternmost and largest branch of the river takes its rise (Fig. 16). The track we followed was that of wild Yaks, and in places impracticable even for our hardy donkeys, unless unladen. The crossing of the glacier-fed side streams proved often dangerous. Compensation for all these difficulties offered in the excellent survey stations to which we could climb en route at heights from 18,000 to 19,000 feet.

Tolai-shan Range.

circ. 19,000 ft. above Sea.

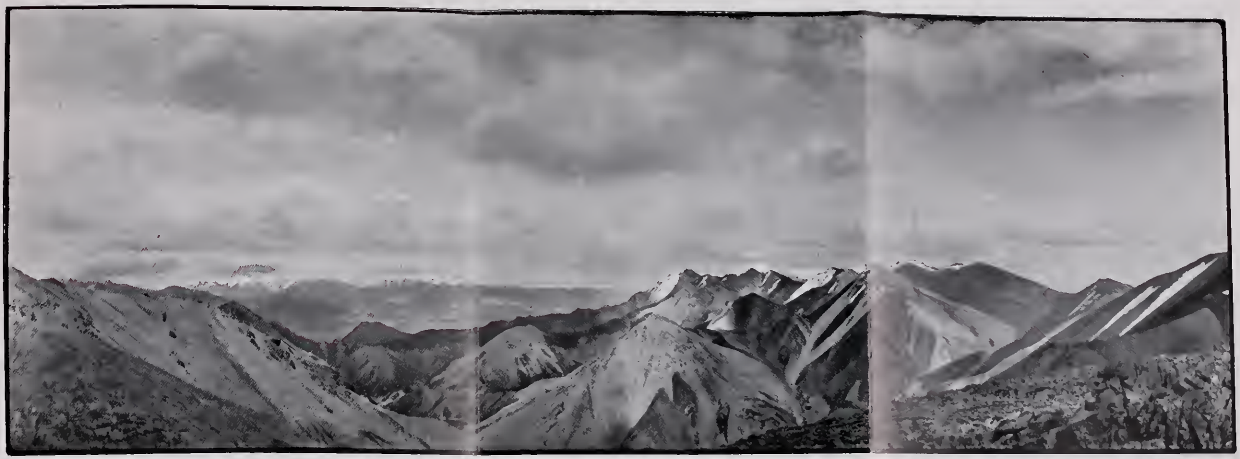


Fig. 14. View South, toward Pei-ta-ho Valley and Alexander III Range, from Pass on Tolai-shan Range.

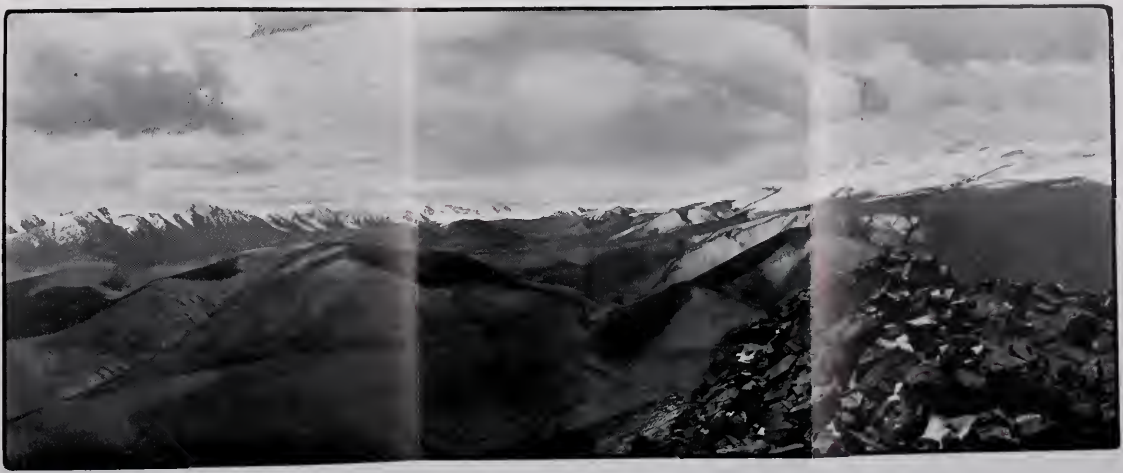


Fig. 16. Glaciers encircling Basin of Easternmost Yurung-Kash sources, seen from Survey Station, circ. 19,000 ft. above Sea.

After thus tracing the great river to its ice-bound head we made our way south over very high plateaus past the glacier-clad range which feeds the Keriya River sources. Our passage was greatly impeded by frequent snow-storms which swept across the high plateaus and valleys, and soon converted the gentle slopes of detritus into veritable bogs.

Then we surveyed the unexplored ground westwards, which in our Atlases generally figures as a blank with the name of "Aksai-chin plain." Instead of a plain we found there high snow-covered spurs descending from the great range which flanks the Yurung-kash sources. A series of elevated lake basins mainly dry extending along the foot of these spurs, facilitated our progress. But their increasing barrenness told heavily on our ponies and donkeys of which, in spite of all care, nearly one-third succumbed in the end. Vegetation, such as it is on these Tibetan uplands, disappeared almost completely after one march from the first lake.

But the most dismal ground was still before us when after a week of long marches we reached a large salt lake. Marching round it to the N.W. we entered a series of basins absolutely sterile and showing in their centre a succession of salt-encrusted dry lagoons. Deathlike torpor lay over the whole region, no living creature could be sighted nor even the track of one. It was a great relief when after three depressing marches we struck traces of the old route by which Haji Habibullah, chief of Khotan at the commencement of the last Muhammadan rebellion, tried to open up direct communication with Ladak and India. We had used up the last of our fodder store when guided by these traces we emerged at last on the evening of September 18th in the valley of an eastern feeder of the Kara-kash.

The only task now remaining was to trace Haji Habibullah's route up to the point where it crossed the main Kun-lun range towards Karanghu-tagh, and to fix our position accurately by linking it up with our former surveys from the north side of the main range. So I ascended on September 22nd, with Lal Singh and some Kirghiz, a steep glacier which seemed to offer the nearest approach to the watershed. The ascent, over miles of much-crevassed ice and *névé* deeply covered with fresh snow, taxed us severely, and it was late when at last we had gained the crest at an elevation of about 20,000 feet. Mapping and photographic work delayed our descent in spite of a temperature of 16 degrees below freezing point at 4 p.m. with the sun shining. No halt was possible en route from fear of getting altogether benighted, and when late in the evening camp was reached, I found that the toes of my feet had been severely injured by frost bite. This was bad luck, indeed; but I was glad all the same to know that our exploratory tasks had been carried through to their end.

Realising the serious results of this accident and the urgency of surgical help I had myself carried down the Kara-kash valley and across the high Kara-koram passes as rapidly as I could in my improvised litter. But it took me seventeen painfully long marches before I reached Leh with its small Moravian Mission Station. The operation there performed cost me the toes of my right foot. The wounds left by it healed very slowly. Thus it was not until the end of January, 1909, that I could reach England, where all my cases with antiques, close on a hundred in number, had just then safely arrived.

The return from a long journey like mine cannot mean rest but only a prelude to labours in some respects even more arduous and important than the work in the field.

The results achieved by my expedition would for the greatest and most valuable part be thrown away if all the exact observations bearing on the physical conditions, past and present; on the ruins unearthed and surveyed; on the antiquities and manuscript remains which have been brought to light by the thousands, were not to be carefully recorded by myself and made thus available for further researches. To give some idea of the extent of these tasks I may mention that our topographical Surveys, on the scale of 4 miles to 1 inch, fill about 94 map sheets of the standard size, and that the mere unpacking and first arrangement of the thousands of archæological objects took nearly ten months. The decipherment of the MSS. and individual documents, probably over 12,000 in number and in about twelve different scripts and languages, will claim the attention of quite a small staff of Orientalist experts, and their labours cannot be started in full earnest until all facts bearing on the origin, date, etc., of the finds as observed by me on the spot have been thoroughly sifted and published. So with all these tasks and responsibilities before me I can at present cherish no more eager wish than that my efforts to secure an adequate record of the results may be successful, and that I may thus be able to do to the end what I feel is my duty to Science.

MEETING OF THE BRITISH ASSOCIATION, 1910.

By J. Howard Reed, F.R.G.S.

The meeting of the British Association for the Advancement of Science, again held in Sheffield this year, after a lapse of thirty-one years, will be long remembered as one of the most successful gatherings of recent times. The people of the steel, cutlery and silver-plate centre did their utmost to make the visit of scientists memorable, both to their visitors and to themselves. Sheffield has the reputation of never doing things by halves, and certainly on the present occasion the city did justice to its well-deserved character.

The chief centre for the members of the Association was the celebrated and historic Cutlers' Hall, used as a Reception Room, which was splendidly arranged for the comfort and convenience of the members, and proved everything that could be desired. The various halls allotted for the Sectional meetings were well within reach of the Reception Room, and were in every case found suitable for the purposes to which they were devoted.

The Lecture Hall at Firth College was allocated to Section E. (Geography), and proved admirably suitable for the work of the section. Its accommodation was ample, but notwithstanding this the room was very frequently well filled. It was found to be an excellent room both for speakers and hearers, and from both points of view the writer can speak from experience.

As is well known, the President of Section E. at the Sheffield meeting was Dr. A. J. Herbertson, M.A., Ph.D., Professor of Geography in the University of Oxford, who some years ago was intimately connected with our Society when Lecturer in Geography in the Manchester University. Dr. Herbertson made an excellent President, and met with a cordial reception at the hands of the members attending the meetings. The Vice-Presidents for the year were Col. Sir Duncan A. Johnston, Mr. G. G. Chisholm, of Edinburgh, Col. H. W Fielden, Mr. J. Bolton, and the writer of this Report. The Committee consisted of Dr. Tempest Anderson, Mr. H. O. Beckit, Col. Bigg-Wither, Mr. D. G. Hogarth, Professor J. L. Myers, Capt. E. Dubois-Phillips Dr. Hamilton Rice, Major L. Forbes, Dr. J. W. Evans and Capt. Henrici. The Rev. W. J. Barton acted as Recorder, while the Secretaries were Mr. E. A. Reeves, Mr. J. McFarlane and Dr. R. N. Rudmose Brown.

At an early meeting of the Committee a suggestion, put forward by the Council of the Association, that Sections C. and E. (Geology and Geography) should become one section, with two departments, came up for consideration. It was decided that the committee of Section C. should be consulted with a view to the adoption of a joint resolution of protest. This was brought up again at a meeting of both Sections on the Friday afternoon, when a resolution, to the effect that the two sections should remain distinct as hitherto, was moved by Dr. Herbertson, seconded by Prof. A. P. Coleman, President of Section C., and carried almost unanimously, much enthusiasm being displayed among both Geographers and Geologists.

As was his duty, the delegate of the Manchester Geographical Society paid special attention to Section E., and had the pleasure of listening to practically all the papers brought before the Section. These were well up to the average, although there was nothing brought forward which created any abnormal or sensational attraction, as has sometimes been the case. The papers read all dealt with some practical work of travel or research, and in several cases proved of most fascinating character.

The Presidential Address, "Geography and some of its more Pressing Needs," given at the opening meeting of the Section, by our old friend Dr. A. J. Herbertson, has been already published in this Journal (see page 21) and speaks for itself. It will be admitted that the suggestions put forward by Dr. Herbertson are of much interest, and must prove of considerable usefulness to those engaged in the work of geographical teaching. The President's address formed the first business of the opening meeting of the Section on the Thursday morning. On its conclusion the detailed work of the Geographers went forward with some rapidity, the morning and afternoon meetings of each day being completely filled up, with very little time for adequate discussion of the subjects brought forward, many of which were well worth considerable attention.

It is impossible in a short report such as this to do adequate justice to the various papers read, but the following abstracts from some of the more important of the papers will give an idea of the wide scope and interesting variety of the subjects dealt with:—

Dr. J. D. Falconer, M.A., F.R.G,S., spoke on "The Origin of some of the more Characteristic Features of the Topography of Northern Nigeria." He pointed out that "The Protectorate of Northern Nigeria comprises an area of about 255,700 square miles, the greater part of which lies between Lake Chad and the confluence of the Rivers Niger and Benue The hydrographical centre of the Protectorate is the Bauchi plateau, which rises to a height of 4,000 to 5,000 feet above sea-level. The rivers belong to two great hydrographical systems, the Niger-Benue system and the Chad or desert system. The watersheds are lofty plains characterised by a matured topography, while the more prominent ranges of hills exert only a very secondary influence on the drainage system. The rivers in their upper and middle courses flow over open plains whose surface is diversified by numerous isolated granite domes, turtlebacks, and groups of rounded hills (inselberge). In their lower courses on the other hand, they frequently flow in deep and trench-like valleys, bounded on either side by ranges of flat-topped hills. The valleys of the upper Benue and of the middle Gongola are more ancient than the Niger valley, and appear to be relics of an earlier hydrographical system. The presence of swampy and lacustrine conditions in Bornu dates from a period preceding the movement of elevation. Lake Chad, as we know it, owes its origin indirectly to its position in a trough between two axes of elevation, and more directly to the recent presence of arid conditions in the Sudan."

Dr. William S. Bruce, LL.D., F.R.S.E., discoursed on "The Exploration of Prince Charles Foreland, Spitzbergen, during 1906, 1907 and 1909." "This communication," he stated, "was a result of explorations carried on by three Scottish expeditions during the summers of 1906, 1907 and 1909. In 1906 Dr. Bruce was accompanied by two assistants and was largely equipped by H.S.H. the Prince of Monaco, who also took the party from and back to Scotland on board his yacht "Princesse Alice," landing them on the north end of the east coast south of Point Carmichael. In 1907 Dr. Bruce chartered the steamer "Phœnix," which took his party of three and himself from Tromsö to Prince Charles Foreland and landed them twelve miles from the south end of the west coast at north end of Edinburgh Isles. The party returned from the Foreland in the walrus-sloop "Johannes Bache." In 1909 the trawler "Conqueror," of Leith, was chartered, the fish-hold being converted into a cabin for officers and scientific staff, and the after-quarters and foc's'le being reserved for petty officers and crew. There were nineteen all told, including scientific staff of seven, besides Dr. Bruce. Captain Napier was master of the ship, now transformed into the yacht "Conqueror." The following are the scientific people who have accompanied Dr. Bruce: Mr. Ernest A. Miller, in 1906: Mr. J. Victor Burn Murdoch, F.G.S., and Mr. Stewart Ross, M.A., in 1907: and Mr. John Mathieson (H.M. Ordnance Survey), Mr. R. N. Rudmose Brown, D.Sc., Mr. J. Victor Burn Murdoch, F.G.S., Mr. Harry Hannay, Mr. Ernest Miller, the late Mr. Angus Peach, B.Sc., and Mr. Alastier Geddes. Piper Gilbert Kerr, formerly piper to the "Scotia," accompanied all three expeditions. The chief object of the expedition was to make a detailed map of Prince Charles Foreland. The map is a continuation of similar work carried on by the Prince of Monaco on the mainland of Spitsbergen and by Norwegians under his direction. The scale is 1 : 126,720 = 2 miles to an inch. The heights on the land are given in feet; the depths of the sea in fathoms. The island is about fifty-four miles long and from three to seven and a half miles broad, having an average width of five miles; the area is about 262 square miles. An almost continuous mountain chain occupies the northern two-thirds of the island. At the south end is a hilly portion, the "Ross Heights," separated from the northern chain by an extensive low-lying part now called the "Foreland Laichs." The northern mountain chain is now named the "Northern Grampians," and in its central part has hills rising to a height of over three thousand feet. The northernmost of these is Mount Monaco (3,800 feet) and the southernmost is Mount Jessie (3,300 feet). They are magnificent, precipitous, sharply peaked mountains with precipices and gullies to the west, while they are heavily glaciated to the east with a large and almost continuous ice-sheet, which is fed from glaciers arising in the first place from the very summits and highest ridges. A considerable number of soundings were taken in Foul Sound demonstrating a bar towards the northern end over which vessels drawing over twelve or fifteen feet have difficulty in finding a passage. In the south end of Foul Sound depths of considerably over a hundred fathoms were obtained, rapidly coming up to three or four fathoms near Ferrier Haven."

Captain J. K. Davis gave a most interesting and instructive address on the "Voyage of the 'Nimrod' from Sydney to Monte Video, May 8—July 7, 1909." Acting under instructions from Sir E. Shackleton, an attempt was to be made to locate the positions of some charted islands marked "doubtful," viz., (1) Royal Company Islands, (2) Emerald Islands, (3) Nimrod Islands, and (4) Dougherty Island. In the event of being able to find any of these "doubtful" islands, they were to land (if possible), obtain their precise positions and main features, etc. In the event of no land being visible at or near the charted position, deep-sea soundings were to be taken and vicinity searched. Meteorological observations were to be taken at intervals of two hours during the voyage, and these are of some interest, as ships do not usually traverse these latitudes in the months of May and June. They visited Macquarie Island, and obtained numerous specimens (skins, skeletons, mosses, rocks, etc.). It was here that Capt. Davis fell in with the modern "Robinson Crusoe," an Irishman, who has lived alone on the island for several years, and who prefers his solitary life to the ordinary conditions of the civilized world as he has experienced it.

The address on "The Metallurgical Industries in relation to the Rocks of the District," by A. McWilliam, A.R.S.M., M.Met., although more geological than geographical, was one of the most interesting and happily delivered addresses of the Section. Its bearing upon the reasons for the special commercial development of Sheffield was much appreciated. "Sheffield" (he said) "is situated on the outcrop of the coal measures, which consist of alternating sandstones and shales, with beds of coal, clay ironstone, and fireclay. The district was in ancient times thickly wooded, affording supplies of the then principal metallurgical fuel, charcoal. The raw fuel of to-day is coal, and the enormous influence of this source of practically all our power, high temperatures, reducing agents, and artificial light is so obvious that it need only be mentioned. The most striking development since the last visit of the Association is the establishment of a line of collieries down the outcrop of the Permian rocks to the east, where the well-known beds of coal were found at reasonable depths. Recent developments even within the last two or three years have made the district one of the richest in the kingdom with regard to coal supply. The clay ironstone, ferrous carbonate with clay, yields an excellent pig iron, containing about 0·6 per cent. phosphorus, and suitable for making into castings and for the manufacture of the best qualities of wrought iron for use as such. This ore is the source of the famous Yorkshire iron, still made near Leeds, though in diminishing quantities. The great bulk of the ironstone now used is the cheaper variety from Northampton, Leicester and Lincoln, and consists of brown iron ore, hydrated ferric oxide yielding pig irons containing about 1¼ per cent. of phosphorus. These are suitable for manufacturing cast iron castings and ordinary wrought iron and for making into basic steel, the refractory dolomite necessary for lining the vessel or making the hearth in which the steel is made being procured from the magnesium limestone to the east. These pig irons are not suitable for making into the highest qualities of Sheffield's special steels, so hematite pig irons, from the hematite ores of Lancashire, Cumberland, and Spain, are imported for making into acid Bessemer or acid open hearth steel, that is, steel made in an acid- or silica-lined vessel or hearth, and that can thus be finished in contact with an acid slag. The best qualities of Swedish wrought irons are also imported for making into cutlery, edge tools, general cutting tools for engineers, etc. As refractory materials for these processes, and even for the roofs of the basic furnaces, much acid material of great purity is required. Some of the coal-measure sandstones consist of particles of quartz that have been cemented by silica, so that the whole rock often consists of 98 per cent. SiO_2. This rock, called ganister, is mined round Oughtibridge and made into refractory silica bricks for withstanding the highest furnace temperatures. A similar firestone is used for building the walls between the crucible holes and for other purposes, and ground ganister, mixed with a little fireclay and water, is rammed round wooden moulds to form the crucible melting holes and also the linings of Bessemer converters. Fireclay is also abundant, providing the firebricks used for the less highly tried portions of the furnaces. Some of the carboniferous sandstones yield splendid grindstones, and building stones are abundant and at high levels, whilst there are deposits that are of the composition necessary for making ordinary bricks without any additions.

The inexhaustible Derbyshire limestone is available as a flux, and the fact that lead mining in the mountain limestone was once a great industry has an important bearing on the manufacture of basic steel, for the great heaps of gangue left by the miners are being worked over for fluor spar, which is used to help in desulphurising the metal . . . Sheffield is therefore situated in the midst of an abundance of flux for dealing with impurities, of fuel for power and for attaining the high temperatures required in the manufacture of iron and steel, and of the best of refractory materials for withstanding these high temperatures; and when materials at hand do not satisfy the severe requirements of the special trades others are freely imported, as in the case of hematite pig irons and Swedish and other wrought irons for making into the highest qualities of special steels."

A most interesting illustrated address, brim full of adventure, on "A Journey through South America from Bogota to Manáos via the River Uaupés," was given by Dr. Hamilton Rice, and this completed the work of the Section up to the week-end, which was given up as usual to excursions and other social matters.

On the Monday the first address given at the morning meeting was on "Cotton Growing within the British Empire," by J. Howard Reed, F.R.G.S. The address was illustrated by Lantern slides. (This address was repeated to the members of the Society on November 1st, 1910, and will appear in full in the next part of the Journal issued; Vol. xxvi, Part 4.)

Major R. G. T. Bright, C.M.G., followed, and read a paper on "The Region of Lakes Albert and Edward and the Mountains of Ruwenzori." He described the country on the western frontier of the Uganda Protectorate and the Lakes Edward, George and Albert, which are interesting geographical features in this region. Lantern-slides graphically illustrated the more striking characteristics of these parts and showed various types of the native inhabitants.

"Through the Heart of Asia from India to Siberia," by Lieut. P. T. Etherton, F.R.G.S., was an original and most informing paper. The expedition from India through Gilgit, Hunza, across the Pamirs, and thence through Chinese Turkestan, Mongolia and Siberia to the Trans-Siberian Railway was undertaken by Lieutenant Etherton, Indian Army, for the purpose of big-game shooting and the study of the larger fauna of Central Asia and Mongolia. The distance covered totalled nearly four thousand miles, and lay over routes which to a great extent had never previously been traversed. The only persons who completed the whole of the journey were Lieutenant Etherton and his native orderly, a Garhwali from the Himalayas, the caravan men and followers being changed from time to time. The average strength of the caravan was ten men, but this was varied to meet circumstances. Lieutenant Etherton left Lansdowne in the Himalayas in March, 1909, and travelled *viâ* Kashmir, the Gilgit Valley, and Hunza to the Pamirs, meeting with great difficulties on the way, owing to the road being blocked by snow and huge avalanches. On the Pamirs the expedition remained one month, camp being at an elevation of from 14,000 to 15,000 feet above sea-level. From the Pamirs Lieutenant Etherton proceeded by the Ili Su Pass (16,750 feet) to the little-known Yarkand River, and thence crossed into the Kulan Urgu Valley by a pass (17,400 feet) which had never previously been crossed by a white man. Here the expedition met with numerous difficulties owing to the mountainous nature of the country, one of the yaks being lost down a precipitous slope, falling over 1,500 feet. After that the greatest difficulty was experienced in crossing fords in the Kulan Urgu valley. Lieutenant Etherton arrived there in June, when the water is at its highest from the melting snow. The fords are extremely dangerous, yet twenty-six of them were crossed in one day. From the Kulan Urgu valley the expedition crossed by two high passes into the valley of the Asgar Sai, and down this to Yarkand, where it arrived in the middle of June after many adventures. Thence the journey was continued onward through Chinese Turkestan for several hundreds of miles to the Tian Shan Mountains, the central portion of the mountain system of Asia. Here three months were passed, during which Lieutenant Etherton visited and traversed the Great Yulduz valley, about which comparatively little is known since the Russian explorer Prejevalsky travelled through a part of it in 1873. In the Tian Shan the expedition was in the midst of the ibex and the Asiatic wapiti country, and some fine specimens of the latter were bagged. Thence the expedition crossed into the Ili valley and on to Kulja, a town of much political importance. From here Lieutenant Etherton struck through the Sairam Nor and Ebi Nor country and the mountains beyond to Chuguchak, a town in Western

Mongolia. In this stage of the march difficulties were numberless, for the region is practically unknown, the people lawless, while the climate at this season (November and December) is noted for its severity. It was in the country bordering on that vast inland sea, the Ebi Nor, that the traveller first saw wild horses. He passed around the Kesil Bach Nor, in Mongolia, another inland sea. The expedition encountered strange nomad tribes of Kalmuks, Kazaks, Kirghiz, and Mongols, concerning whom many interesting notes were gathered. The expedition reached the foot of the Great Altai Mountains on the northern side of the Black Irtish valley at the end of December, with the thermometer at −35° and the whole country ice-bound. The Altai form the principal range in this part of Asia, their composition consisting largely of argillaceous schists, with granite in the higher parts, and alluvium and diluvium lower down. In this extensive chain is found a great variety of the larger fauna, including *Ovis Ammon*, the true Argali of the great Argali sheep of Central Asia, as well as the Altai wapiti, red bear of a species peculiar to the Altai, roe deer, and other animals. While in the Altai the expedition was caught in a blizzard, and practically the entire caravan was frost-bitten, including Lieutenant Etherton and his orderly. Thence ensued twelve fearful days of trekking to a small military post on the Siberian-Mongolian frontier, where medical assistance was available. The expedition arrived here on January 9, 1910, and a month later continued the journey for eight hundred miles through Siberia to the Trans-Siberian Railway, mostly by sledge. Lieutenant Etherton's trophies included ibex, the rare Asiatic wapiti stag, roe deer, *Ovis Karelini*, &c. He reached England in March, 1910.

On the Tuesday, the last day for the reading of papers, several short communications were dealt with. A paper on: "A New Globe Map of the World and a New Equal-scale Atlas," by W. Wilson, was of some interest.

The use of the globe as an aid in teaching geography has largely disappeared owing to the high cost and cumbrous nature of the globes employed. The author overcomes this difficulty by mounting a special globe map on thin cardboard and cutting out the gores. The two ends of the map are joined at the equator by a clip; a spindle is introduced, and the tips of the gores are passed down over the ends of the spindle by means of holes punched at the ends of each gore where the poles would be, a metal clip at each end holding the tips in position and serving as a convenient means of handling the globe. The result is an instrument which can be used effectively in place of an ordinary globe. It can be made up or dismantled in a few seconds, studied as a flat map or as a globe, and packs readily, taking up no more space than an ordinary school book.

Several novelties have been introduced with a view to giving beginners a firm mental grasp of the world as a globe, but space forbids a description of these.

A paper on: "The Andover Region: The Geographical Aspect of its Present Condition," by O. G. S. Crawford, was one of no little interest and dealt with the Physical Features, Natural Vegetation, Industries, Settlements, Communications, &c.

A similar paper of a much more detailed character was read by Mr. J. Cossar, on: "A Regional Survey of Midlothian."

A paper of local interest was read by Mr. Harold Brodrick, M.A., on: "The Underground Waters of the Castleton District of Derbyshire."

"To the west of Castleton and 600 feet above it is a long valley, in the base of which runs one of the transverse Pennine faults. This fault brings down the carboniferous limestone, so that the streams to the north run over the Yoredale rocks to sink into the limestone. There are several streams, but only one ends in a cave of any size, the Giant's Hole. This has been explored for a distance of 410 feet, where the water sinks in a deep pool. These waters run through an unknown course near which is Elden Hole, a vertical shaft 200 feet deep, with a further drop of about 50 feet below. This is now dry. The water is next met with at the upper end of the Speedwell Cave, where it wells up from a deep pool. The stream flows through the Speedwell Cave for 800 feet into the disused workings of the Speedwell Mine, being joined on its way by another passage 500 feet long, at the upper end of which is a fine chamber. The combined streams flow through the old workings for 1,000 feet, and finally fall into the so-called 'bottomless pit,' which is actually 90 feet deep, the bottom being filled with water 22 feet deep. The upper extension of the pit has not been explored within historic times, although the miners evidently climbed it. From the Bottomless Pit to the entrance of the Speedwell Mine there is a straight flooded working 750 yards long, through which visitors are taken in boats. The next point at which the stream is met with is at the upper end of the Peak Cave. It flows in here at two points, which passages are found to join at about 100 yards from the portion of the cave ordinarily visited. The total length of the Peak Cave ordinarily visited is 1,528 feet."

Dr. Charles A. Hill, M.A., M.B., D.Ph., spoke on: "Further Exploration of the Mitchelstown Caves, 1908–10."

"An account of these two caves, as far as was then known, was read by the author at the Dublin Meeting 1908. Since that date two visits have been paid to the spot, and an exhaustive exploration and survey of both caves completed. Some of these results have already been published in the *Proceedings* of the Royal Irish Academy (1909). The present paper detailed the results of the latest exploration in March, 1910, and was illustrated with numerous lantern slides of stalactite formations within the caves, together with maps and plans. The total length of the passages surveyed in the two caves measures about a mile and a half."

As already stated the work of Section E at Sheffield may be considered very satisfactory, the meetings were generally well attended and much interest was evoked.

I attended the meetings of the Conference of Delegates of Corresponding Societies as representative of this Society. The meetings were as usual of interest but the matters discussed were not of special moment to our Society. A draw-back of these Conferences seems to be the difficulty of arranging the meetings so as not to clash with other important gatherings, the result being that many delegates cannot attend, or are obliged to come late or leave early.

The writer attended the meetings of the General Committee of the Association as usual. One of these meetings on this occasion was of special interest because of the genial presence of Sir George Reid, the Australian High Commissioner, who attended as one of a deputation to invite the British Association to visit Australia in either 1913 or 1914. After the withdrawal of the deputation the matter was discussed at considerable length. The final decision of the Committee was the acceptance of the invitation for 1914, so that British Scientists will journey to the Commonwealth during that year. There is no doubt that the reception they will receive will be one of epoch-making character. The Commonwealth Government are to set aside a large sum of money for the entertainment of the visitors, who are to visit all the great centres, while the railways and tramways are to be free to the members of the British Association. Apparently as an extra inducement in pressing the acceptance of the invitation, Sir George Reid stated, that visitors from Britain would be sure to find many hospitable homes open to receive them when they arrived in Australia. Altogether 1914 promises to be a great year for those members of the British Association who are able to attend the meeting. In 1911 the meeting is to be held at Portsmouth, Dundee has been chosen for 1912, while Birmingham has been suggested for 1913.

The Victoria Hall in Norfolk Street, where the Presidential Address was delivered by Professor Bonny on the evening of the opening day, is handsome and well lighted, and proved most suitable for that gathering, and for the other evening meetings of a general character which were arranged. Professor Stirling's address on "Types of Animal Movement," given in this hall on the Friday evening, was one which justly awakened much interest. The lecture was delivered in Dr. Stirling's inimitable style. The address given in the same hall on the Monday evening by Mr. D. G. Hogarth, M.A., on "New Discoveries about the Hittites,' was also a discourse of much interest and was greatly appreciated.

On the Saturday evening the Sheffield Musical Union, under the direction of Dr. Henry Coward, gave an excellent concert in the Albert Hall in honour of the British Association, the members of which accepted invitations in large numbers, and much appreciated the rich treat provided for them.

The official service in Sheffield Parish Church on Sunday morning was attended by a large number of the members, including practically all the official and more distinguished persons attending the meeting. The Archbishop of York preached the sermon, which it is needless to say was specially suited to the occasion.

In conclusion, it may be stated that the Sheffield Meeting of 1910 will ever be memorable not only for the useful scientific work done, but also for the most hospitable and well-organised social functions with which the whole Meeting was embroidered and illumined. Specially noteworthy among the functions were the evening gatherings at the Town Hall and the University, and the monster garden party given at Wentworth Park by the Earl and Countess Fitzwilliam. Long will the beauty of Wentworth and the lavish hospitality of its owners be remembered.

ANNUAL MEETING OF THE SOCIETY, 1910.

The Twenty-fifth Annual Meeting of the Society was held, by kind permission, in the Lord Mayor's Parlour, Town Hall, Manchester, on Thursday, September 29th, 1910, at 3 p.m.

The Right Hon. the Lord Mayor (Mr. Charles Behrens) presided.

Letters of apology for absence were read from Messrs. E. W. Mellor, J.P., F.R.G.S., S. Oppenheim, J.P., D. A. Little, and G. Ginger.

The following were present:—Mrs. F. Zimmern, Miss L. Edna Walter, B.Sc., H.M.I., Right Rev. Bishop Welldon, Dean of Manchester, Messrs. Harry Nuttall, M.P., F.R.G.S., and F. Zimmern, F.R.G.S., Alderman Sir Bosdin T. Leech, J.P., Messrs. John Ainsworth, C.M.G., J. E. Balmer, F.R.G.S., A. Balmforth, W. D. Bailey, C. A. Clarke, G. T. Cook, Isaac Chorlton, E. Roose Evans, R. Kalisch, F.R.G.S., A. W. Longden, F. S. Oppenheim, M.A., R. Cobden Phillips, A. Rée, Ph.D., J. Howard Reed, F.R.G.S., Harry Sowerbutts, A.R.C.Sc., T. W. Sowerbutts, F.S.A.A., W. Spencer, Egbert Steinthal, Joel Wainwright, J.P., and others.

The Minutes of the Twenty-fourth Annual Meeting held on May 6th, 1909, were taken as read, as a full report of that meeting was printed in Vol. XXV of the Journal, page 86.

The Report of the Council for 1909, given below, was not read as each one present had a copy, but Mr. T. W. Sowerbutts, in the absence of the Hon. Treasurer, gave a summary of the Accounts which follow the Report.

REPORT OF THE COUNCIL FOR THE YEAR ENDED DECEMBER 31st, 1909.

The Council are gratified to be able to report that this, the year of our 25th anniversay, has been a record year in the history of the Society.

Two justly celebrated explorers from distant parts of the globe—Central Asia and the Antarctic—have been welcomed by our members, and on each occasion the Free Trade Hall was crowded with an interested and enthusiastic audience, who listened with much delight to the accounts of the explorations of Sir Sven Hedin and Sir Ernest Shackleton.

In each case the explorer was entertained at a banquet on the day following the lecture, and both of these gatherings were largely attended. During the proceedings the travellers were respectively elected Honorary Members of the Society.

The banquet to Sir Ernest Shackleton, held on November 6th, also constituted the official celebration of the 25th anniversary of the Society. The function was attended by some 300 members and friends, and was a memorable event.

The ordinary weekly meetings of the Society have been more generally successful than ever before. The gallery referred to in the last report has been provided, and has increased the accommodation of our hall by almost 100 seats. The attendance at the meetings has risen from slightly over 200 to an average of almost 300, thus proving that the extra accommodation was provided none too soon. The Building Company are to be congratulated upon the manner in which their architect has increased the seating capacity of the hall without detracting from its appearance, and the directors are thanked for the prompt manner in which they complied with the request of the Society for the increased accommodation.

The detailed list below will indicate the comprehensive character of the lectures delivered during the year, all of which were illustrated with lantern views:—

"The Western Highlands and Islands of Scotland." Mr. J. Stephenson Reid.
"Germany." Mr. M. Seifert.

"Rambles in Goethe's Country." Rev. W. Thomas.
"Alpine Peaks and Valleys." Mr. J. Walter Robson.
"Glaciers and their Work." Miss L. Edna Walter, B.Sc., H.M.I.
"At Geneva with the International Geographical Congress and After." Mr. H. C. Martin, F.R.G.S
"The Chateaux of the Valley of the Loire." Mr. Councillor Walter Butterworth, J.P.
"After Stevenson, through the Cevennes: A Cycling Pilgrimage." Mr. W. Fitzwater Wray.
"The Pyrenees and Spain." Councillor H. Hibbert, F.R.G.S.
"Portugal and the Canary Islands." Mr. F. Stevenson.
"Sicily." Miss A. M. Philips.
"Servia and its People." Mr. Charles B. Howdill, A.R.I.B.A.
"Bosnia and Herzegovina." Mr. A. R. Colquhoun, F.R.G.S.
"Greece." Rev. Cowley Clarke.
"Through Unknown Central Asia." Dr. Sven Hedin, F.R.G.S.
"Life in Annam." Madame G. M. Vassal.
"Peking." Mr. Edmund Cousins.
"A Wayfarer in Rural Japan." Mr. Harold E. Young.
"Osaka: Its History and Development." Mr. S. Yamanobe.
"Morocco and the Moors." Dr. J. Johnson.
"Egypt: A Land of Treasure." Dr. Percy Withers.
"Rambles and Scrambles on the Pacific Slope, and in the Yellowstone Regions of the Far West." Mr. Harold E. Young.
"The Panama Canal." Mr. S. Hardman, F.R.G.S.
"British Guiana." Mr. E. R. Davson, F.R.G.S.
"Venezuela." Miss Gabriela de Bolivar.
"Arctic Exploration." Mr. G. H. Warren.
"Midst Arctic Snows." Mr. Sandon Perkins, F.R.G.S.
"Nearest the South Pole." Lieutenant E. H. Shackleton, C.V.O., F.R.G.S.
"Some Thoughts suggested by travels over the Empire." Rt. Rev. Bishop Welldon, Dean of Manchester.

A large number of members accepted an invitation, given by Major and Mrs. Greg, to visit Norcliffe Hall, Styal, on May 22nd, and highly appreciated the kindness and hospitality they received. The Council take this opportunity to express their thanks to our Vice-President and Mrs. Greg for the enjoyment conferred on the large number of visitors present.

The Journal for the last three quarters of 1908 and for the first quarter of 1909 has been issued during the year.

Valuable additions to the library and map room have been made during the year, consisting mainly of exchanges for the Journal of the Society. The Council would highly appreciate gifts of any new geographical books, as they have so far been unable to devote any part of the funds to the purchase of such works.

The Victorians have again performed useful service, chiefly by lecturing on behalf of the affiliated Societies and of members, and by arranging for social gatherings to bring the members together, and incidentally by such means to help the finances. The Society is indebted to the Victorians for their services as stewards on the two occasions of the Free Trade Hall meetings.

The Council feel that they cannot adequately thank their colleague, Mr. E. W. Mellor, J.P., F.R.G.S., for his invaluable help with his splendid lantern in the Free Trade Hall on the occasions of February 12th and November 5th, 1909.

They desire again to acknowledge their indebtedness to the member who defrays the expense of the special prize awarded on the result of the examination in geography at the University of Manchester.

The thanks of the Society are due to Mr. Henry Kirkpatrick, J.P., of Tyldesley, for his generosity in presenting five of his shares in the Building Company to the Society, and the Council trust that the condition attached thereto, providing for the election of two students of Tyldesley as members, may be of assistance, both to the Society and to the district of Tyldesley.

The balance-sheet for the year, with the report of the Honorary Auditor, is presented herewith.

It is satisfactory to note that the adverse balance of £34 has now been transformed into a surplus of £130, notwithstanding that three further life compositions have been invested in shares of the Building Company, making six in all.

The Council greatly deplore that the loss of members by death is larger than in any previous year. Among the losses we have sustained may be mentioned :—

H.M. the King of the Belgians.
The Rt. Hon. Earl Egerton of Tatton.
Surgeon-Major W. G. Black.
Mr. A. J. S. Bles, J.P.
,, G. T. Bowes.

Mr. J. B. Dowdall.
,, George Hadfield, J.P.
,, Andrew Jackson.
,, J. Jucker.
,, A. Laidlaw.
,, John Logan.
,, Robert Luke.
,, Alderman A. McDougall, J.P.
,, A. Midgley.
,, C. B. Milnes.
,, Eli Pidd.
Rev. Canon W. C. Porter, M.A.
Mr. G. H. Seed.
,, Wm. Turner.
,, John Walkden, J.P., C.C.

The Council, in conclusion, assure the members that the best interests of the Society are ever in their minds. They desire to thank the general body of members for support during the year, and trust that their efforts on the Society's behalf will be approved. The year has been a specially successful one, and forms a very fitting conclusion to the first quarter of a century of the Society's work. The Council feel that the present satisfactory position can not only be maintained, but materially improved and strengthened if all the members will continue loyally to do their part. A larger number of members is still needed, and for these the Society must depend mainly upon introduction of friends by those already in the ranks. The twenty-five years' work of the Society has not been without many difficulties and disappointments, but the present position shows that it has not been in vain.

The prospect is certainly encouraging, and with the united support of the members progress should continue, and greater successes be attained in a work of usefulness to the city and community and in the promotion of the study of geography.

REVENUE ACCOUNT.

YEAR ENDING DECEMBER 31st, 1909.

Dr.

1908 £	s.	d.		£	s.	d.
94	*18*	*9*	To Expenses of Meetings	104	3	2
113	*5*	*4*	,, Journal, less sales and advertisements	120	2	4
130	*8*	*10*	,, Rent, Lighting and Insurance	140	12	8
85	*10*	*0*	,, Salaries	104	5	0
110	*0*	*1*	,, Wages and Sundry Expenses	101	16	8
9	*7*	*0*	,, Commission and Expenses, New Members, and Collection of Subscriptions	12	2	5
7	*8*	*8*	,, Books, Maps, Binding, &c., Library	5	11	11
3	*13*	*5*	,, Repairs to Furniture	3	1	7
554	*12*	*1*	Total Expenditure	591	15	9
			Balance Carried to Balance Sheet	164	2	5
				£755	18	2

Cr.

1908 £	s.	d.		£	s.	d.	£	s.	d.
			By Members Subscriptions :—						
31	*10*	*0*	Life (Transferred to Reserve Account)	31	10	0			
468	*6*	*0*	Ordinary	490	7	0			
43	*11*	*6*	Associate	55	18	3			
16	*16*	*0*	Societies	14	14	0			
							560	19	3
4	*0*	*0*	,, Victorians				3	14	6
—			,, Hire of Chairs				3	15	0
—			,, Dividend on Shares in B. Co.				7	0	1
	7	*0*	,, Bank Interest				2	0	11
—			,, Donations				3	7	9
533	*0*	*6*	Ordinary Income				580	17	6
			Net Surplus on Public Lectures, Less Special Expenditure Incurred				175	0	8
							£755	18	2

BALANCE SHEET, DECEMBER 31st, 1909.

LIABILITIES.

				£	s.	d.
To Sundry Creditors				63	15	11
,, Subscriptions paid in Advance				79	5	6
,, Life Membership Reserve Account				83	2	6
,, Kirkpatrick Endowment Fund				50	0	0
,, Balance from Revenue Account	164	2	5			
Less Deficit at December 31, 1908	34	1	3			
				130	1	2
				£406	5	1

ASSETS.

				£	s.	d.
By 36 shares of £10 each fully paid in the M.G.S. Bldg. Co., Ltd., as under :—						
16 shares purchased	60	0	0			
20 shares presented	200	0	0			
				260	0	0
,, Subscriptions in arrear				21	10	6
,, Cash at Bank	121	9	10			
,, Cash in Hand	3	4	9			
				124	14	7
				£406	5	1

NOTE.—The Furniture, Fittings, Books, Maps, &c., Lanterns, Slides and Stock of Journals, which are insured for £1,000, are not included as Assets in the above Statement. There are 43 Life Members, and the subscriptions of 35 of this number have been taken as revenue in years prior to 1908.

I have audited the above Balance Sheet and certify the same to be correct. I have inspected the Certificates for the Shares in the Building Company.

THEODORE GREGORY (F.C.A.),
Honorary Auditor.

March 30th, 1910.

The Right Hon. the Lord Mayor, in moving the adoption of the Report and Balance Sheet, congratulated the members on the flourishing condition of the Society after twenty-five years of excellent work: and he wished it every prosperity in the future. He was convinced that their work was of no small benefit to the community. Manchester people sometimes prided themselves on being the hub of the universe, and he felt sure that coming into contact with the great explorers must act as an exhilarating tonic to our people and do much good. The past year had been an eventful one geographically. The members of the Society might justly feel proud of the notable men they had received during the year, as all are ready to acknowledge courage wherever we find it, and he was bound to say that for pluck and endurance it would be difficult to beat some of our present day explorers. In that connection he might allude to Captain Scott, who was now starting on what they trusted would be a successful voyage to the South Pole. He felt personally very proud of the generous response which Manchester made to the appeal to help Captain Scott, enabling him to collect £2,188 towards the cost of the Expedition. It showed how interested Manchester was in geographical and scientific work and that interest he felt had been nurtured by the Geographical Society.

Mr. Harry Nuttall, M.P., F.R.G.S., in seconding the resolution, said that the Society had made great strides since it was inaugurated in a little room in Brown Street a quarter of a century ago, and especially since the opening of the handsome new rooms in St. Mary's Parsonage. One could not imagine Manchester without the Geographical Society. The Science of Geography touched almost all the Sciences, and if people realised to the extent which they might do the advantages, intellectual, moral and material, to be obtained from a study of Geography, the Society would have many more members than they now possessed, and additional members were required in order that more work might be done.

The resolution was supported by the Right Rev. Bishop Welldon, who had just returned from a journey among the Republican States of South America. He disclaimed the idea, suggested by the Lord Mayor, of being a great traveller as he had kept to the beaten paths. Such journeys, however, as he had been able to make in foreign lands had been sources of true pleasure to him. He heartily commended the work of the Society. The lectures of the past year had, in his judgment, fully maintained the reputation of the Society. The line which he had always been inclined to take was that whatever was best, and most recent in geographical knowledge should be laid before the public of Manchester. He did not care about the expense: the policy of boldness was the policy of success, and the Society had done well during the past year in bringing to Manchester famous explorers, and he hoped that the Council would never fail to invite and to compel every explorer to give his story in Manchester. More and more our public was coming to appreciate the value of the study of Geography in the interests of commerce as in other respects, and he looked upon this Society as rendering the best service to the Community.

The Resolution that the Annual Report and Balance Sheet be adopted was passed unanimously.

Mr. John Ainsworth, C.M.G., of Nairobi, East Africa, and a life member of the Society, moved that the best thanks of the Meeting be given to the Officers and Council for their services during the year. Mr. R. Kalisch, F.R.G.S., in seconding the resolution which was passed unanimously, said that, in his opinion, the Society did not receive the support it deserved, and trusted that the Council would if possible increase their efforts to make the Society more known and more able to do good work.

Mr. F. Zimmern, in moving the next resolution, gave some particulars of the Society's History, he mentioned that the Duke of Devonshire was our first President, on his death the Duke of York was approached and he consented to be President; after nine years his Royal Highness became Prince of Wales in 1901 and continued in the office of President. The death of the late King in May caused the postponement of the Annual Meeting until His Majesty King George could be approached. The Council are pleased to say that His Majesty has graciously consented to become Patron of the Society. The Council had unanimously resolved to nominate Mr. Harry Nuttall, M.P., Chairman of the Council, for the office of President thus rendered vacant, and Mr. Zimmern said that it gave him great pleasure to move that Mr. Nuttall be elected President of the Society. He said that Mr. Nuttall was one of the original members and had given valuable help at all times to the Society, especially in connection with the new building, the possibility of the erection of which, was in a great measure due to Mr. Nuttall. Mr. J. Howard Reed, in seconding the resolution, gave further particulars of Mr. Nuttall's services for the Society.

The resolution that Mr. Nuttall be elected President was passed unanimously.

Mr. Nuttall, in acknowledgment of his election, thanked the Members and promised that he would in the future, as in the past, endeavour to do what he could to help the Society to carry on its work.

A copy of the list of the Nominations for the other Officers and for the Council having been handed to each member present, Mr. A. Balmforth moved, Mr. E. Roose Evans seconded, and it was resolved that the Officers and Council as nominated be elected. (See list on page 166).

Mr. C. A. Clarke, in moving the following resolution, said that this would be the twenty-sixth consecutive time that Mr. Gregory had been elected and that the Society was greatly indebted to him:—

"That the best thanks of the Society be given to Mr. Theodore Gregory, J.P., F.C.A., for his services as Hon. Auditor, and that he be re-elected."

Mr. R. Cobden Phillips seconded the resolution, and it was passed unanimously.

It was moved by Mr. Joel Wainwright, J.P., seconded by Mr. J. Stephenson Reid, and resolved unanimously:—

"That the best thanks of this Meeting be tendered to the Lord Mayor for the use of his parlour, and for his kindness in presiding over the Meeting."

List of Council and Officers.

Patron.

HIS MAJESTY THE KING.

President.

Mr. H. NUTTALL, M.P., F.R.G.S.

Vice-Presidents.

The Right Hon. the Earl of Derby, G.C.V.O.
The Right Hon. Lord Rotherham of Broughton.
The Right Rev. the Bishop of Salford.
The Right Rev. Bishop Welldon, Dean of Manchester.
The Right Hon. the Lord Mayor of Manchester.
His Worship the Mayor of Oldham.
His Worship the Mayor of Salford.
The Vice-Chancellor of Manchester University.
The Right Hon. Sir William Mather.
Sir W. J. Crossley, Bart., M.P.
Sir W. H. Houldsworth, Bart.
Sir C. E. Schwann, Bart., M.P.
Sir Humphrey F. de Trafford, Bart.
Sir Frank Forbes Adam, C.I.E.
Alderman Sir James Duckworth, F.R.G.S.
Alderman Sir Bosdin T. Leech, J.P.
Mr. Frederick Burton, J.P.
Mr. J. F. Cheetham, J.P.
Colonel H. T. Crook, J.P., V.D.
Professor W. Boyd Dawkins, J.P., F.R.S.
Colone E. W. Greg, J.P., C.C., F.R.G.S.
Mr. J. G. Groves, D.L., J.P.
Mr. W. Joynson-Hicks, F.R.G.S
Mr. J. S. Higham, M.P.
Mr. N. Kolp.
Mr. John McFarlane, M.A., M.Com., F.R.G.S.
Mr. E. W. Mellor, J.P., F.R.G.S., *Vice-Chairman of the Council.*
Mr. S. Oppenheim, J.P.
Mr. J. Howard Reed, F.R.G.S.
Mr. C. P. Scott, J.P.
Mr. Hermann Woolley, F.R.G.S.
Mr. F. Zimmern, F.R.G.S., *Chairman of the Council.*

Trustees.

Mr H. Nuttall, M.P., F.R.G.S.
Mr. Sidney L. Keymer, F.R.G.S.
Mr. E. W. Mellor, J.P., F.R.G.S.

Honorary Treasurer.

Mr. David A. Little.

Honorary Secretaries.

Mr. J. Howard Reed, F.R.G.S.
Mr. Egbert Steinthal.

Honorary Secretary (Victorians).

Mr. C. A. Clarke.

Council.

Mr. W. S. Ascoli, F.R.G.S.
Mr. J. E. Balmer, F.R.G.S.
Mr. Jas. Barningham.
Mr. C. A. Clarke.
Mr. C. Collmann,
Mr. George Ginger.
Mr. J. Howard Hall.
Mr. Alderman T. Hassall, J.P.
Mr. Horace C. Martin, F.R.G.S.
Mr. T. C. Middleton, J.P.
Mr. F. S. Oppenheim, M.A.
Mr. George Pearson.
Mr. R. C. Phillips.
Mr. Alfred Ree, Ph.D.
Mr. J. Stephenson Reid.
Mr. T. W. Sowerbutts, F.S.A.A.
Mr. George Thomas

Honorary Auditor.

Mr. Theodore Gregory, J.P., F.C.A.

Reviews.

"THE KHALIFATE OF THE WEST." By Donald Mackenzie. With maps and illustrations. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. Price 10/6.

At a period when the country of Morocco is so much to the fore in public interest the appearance of the above-named work is most opportune. The writer, who possesses a special knowledge and experience of the country about which he discourses, has succeeded in producing a most useful and informing volume. He speaks of it as "a general description of Morocco," but it is really much more than this. A glance through the headings of his chapters shows this at once, and we find that not only are the country and its towns and cities carefully described, but that much can be learned of its history, its commerce (such as it is), its natural wealth, and the habits and customs of its more or less various peoples.

The natural richness of the country, and the criminal neglect from which it suffers, are well presented by the following remark which appears very early in the book: "It seems strange that an enormous territory like Morocco, naturally so rich and within five days' steam of England, should have been permitted to remain so long in its present barbarous condition. Immense tracts of uncultivated land may be met with all over the interior; indeed, the whole Empire appears to be thinly peopled and the greatest part is in a state of desolation. I have often been struck, while riding through this country, by the remarkable richness of the soil, which in some cases reaches a depth of fifteen feet. What a splendid place for British settlers so near our own doors!" In speaking of the country inland, at no great distance from Cape Juby, attention is again drawn to its natural fertility. "The natives informed me," says Mr. Mackenzie, "that the country in the interior was entirely free of sand, composed only of red earth and rock, such as we had passed over. The sand-hills stretched from north to south not far from the sea-shore; once these are crossed, sand does not exist any longer. The journey had opened my eyes to the character of the country surrounding us and gave me notions of its capabilities and natural resources very different from those I had formerly entertained. This country, in the hands of civilised people, could be cultivated and made to yield almost anything."

It comes as a surprise almost to read of a wide and important river flowing through a portion of Morocco, but the author of the work under review seems to have been equally astonished by such an experience. He visited the stream of the Sagia El Hamra, which taking its rise in the Atlas Mountains sweeps through a considerable area of territory and enters the Atlantic some 60 miles to the south of Cape Juby. He says:—"Almost perpendicular banks rose on each side to a height of about 150 feet, and the channel was about three miles broad. It was full of trees and bushes, so thick as almost to impede one's progress, and was haunted by a variety of wild animals. Down the middle of the channel flowed a stream of fresh water about a mile wide. . . . I was astonished at this immense river, for it could be called nothing else, the sight of which seemed to give me very different ideas of the great desert. . . . All that the land in its neighbourhood required was cultivation to render it fertile and productive."

The extracts quoted give some idea of the interest of the work from the geographical point of view, but the volume is brim full of matters of general interest, and it should certainly be read by all who desire to enlarge their knowledge of one of the most benighted countries of the world. The work is well illustrated by many reproductions of photographs; and contains two or three sketch maps, which are perhaps too microscopic to be of any great use. Mr. Mackenzie is to be congratulated upon the production of this book which will go far to supply a much-felt want. J. H. R.

"Modern Geography." By Marion I. Newbigin, D.Sc. (London). Home University Library of Modern Knowledge. London: Williams and Norgate. Price 1/-.

The "average" man is deeply indebted to Miss Newbigin for this volume of the Home University Library. Geography is here presented to him in an entirely new aspect. The busy man generally has a preconceived idea of Geography as a list of names, with a table showing mountain heights and lengths of rivers. This view is shattered by a very pleasant series of blows and he finds that Geography deals with his mode of life, his food, his pocket and his very movements. He is first shown clearly the work of water and ice in the formation of the surface of the earth and then passes on to Climate and the Weather. The latter favourite topic forms pleasant reading in this volume. British weather is taken as one of the texts for discussion and the causes of our English "bad" and "good" summers are well demonstrated. In reviewing the chapters treating of the why and wherefore of the distribution of plant and animal life one can scarcely refrain from quoting at length from the portion on the influence of disease-transmitting flies on the movements of man. This is very graphically described and the reader is also shown clearly the movements of many of our so-called "English" plants and fruits before they were cultivated in England. Quoting one extract from the chapter on the races of Europe will show that Miss Newbigin approaches the matter in such a way as to clear up many misconceived notions as to nationality and race. She says: "Unfortunately for accuracy the people within the British area who speak Celtic languages are not all of the same race and there is nothing more certain than the fact that few of them, if any, have any distinct trace of Celtic blood." Lastly Miss Newbigin discusses the distribution of metals and their influence on the movements and settlements of man, and at the end of the book, for those wishing to pursue the subject further, a list of books is added with notes thereon.

Geographers will welcome this attempt to reach the general public by means of a well-written, interesting book at a popular price. J. H. B.

The Journal
OF THE
Manchester Geographical Society.

* * *

SIERRA LEONE AS AN ASSET OF THE EMPIRE.

By Rev. Canon F. C. Smith, M.A., F.R.G.S.

(Addressed to the Society in the Geographical Hall, on Tuesday, October 18th, 1910.)

The full title of my paper is: Sierra Leone of to-day, with speculation on its future value to the Empire.

I have undertaken the treatment of a subject which ought perhaps to be left severely alone, on the ground that few willingly regard the Colony of Sierra Leone as of particular value.

According to the idea of many, Britain holds the place, partly from sentiment, and partly because we happen to have it on our hands. It is like a piece of old family furniture, which must needs be kept, because it has been in the family so long.

My personal idea of its value as an asset of the Empire, is based upon what I believe to be its commercial merit, apart from the added value of the harbour for probable strategic purposes, a worth that may some day prove to be beyond calculation.

A few years ago, someone exclaimed to me, "Oh, that's the country without a future."

My endeavour just now will be to shew that the whole Colony and Hinterland have intrinsic value, with a possible future surpassing the most sanguine present expectations.

If I am entitled, after a fairly long experience of life in Africa, to express any opinion in accordance with the above heading, then, under the right of such title I am bound to ignore what others may think.

The real condition of the West Coast is, to my mind, better than it has been made to appear to the World, and if that were not so, we could scarcely discuss its future hopefully.

West Africa has never yet displayed her best. What she may yield, she has screened effectively under tales of horror, consisting of episodes in Slave Trade history; expeditions with disastrous consequences, a remorseless climate, and the hardships inseparable from long sea voyages, previous to the days of propulsion by steam.

A good reputation of the Coast has scarcely existed, for where men won prizes in high salaries, and where wealth was acquired by advantages due to pioneer trade, so constantly did health suffer prematurely in all, and death mow down many of the naturally strong, that it became habitual to condemn the place by sweeping denunciation.

Freetown was for a long time considered to be pre-eminently "The White Man's Grave" and tales are still related as reminiscences which can scarcely be believed, but the Cemeteries confirm something of the tale of woe, and statistics assure us that the name was once well deserved, yet it is something of a wilful libel to say that it is deserved now, although deaths occur frequently, and with such dramatic suddenness as to alarm those who have friends resident in the Colony.

When a Native says of Sierra Leone, that it is "Black man's Country, white man's corner" he conveys the meaning that the place is comparatively deadly to non-indigenous people, for history is continually proving it so.

In 1829 there were forty-one deaths of Europeans during the year, and fifty-three deaths occurred on the roll of C.M.S. Missionaries during a period of twenty years: figures that are alarmingly heavy compared with the total White population.

A writer of the year 1836, remarked that the mortality was "not by any means startling." and he considered the title "White Man's Grave" scarcely deserved.

Unfortunately for that opinion the conclusion seems to have been arrived at by contrast with the (then) death-rate in Jamaica, which you will allow was startling enough when I tell you that it amounted in the year 1819 "to 722 deaths out of 812 persons in one year."

For the purpose of my plea that we should revise a bad tradition, this fact in history serves admirably.

Whether we believe the advertisement or not is immaterial, but Jamaica nowadays is advertised as being one of the premier health resorts of the whole wide world, and that in spite of the fact that less than a century since, it was the most deadly spot known for Europeans to reside in.

There is something worth attention in the statement of a Bishop* who arriving from Zanzibar, said that he found that people died in England.

After rather more than seven years of experience in connection with Sierra Leone, I have come to the conclusion that with care and caution there is nothing to dread about the climate.

During my time we have lost by death an army General, a Commander of a war-ship, a Bishop, the son-in-law of Dr. Livingstone, and others less well known, and the feature of note about each is the quite unexpected nature of their transit to another world. It is the fact of their sudden exit which gives colour to an old story, and men are still unwilling to lose the morbid idea engrossed in the evil title "The White Man's Grave."

For the present necessity my mind runs strongly against diminishing the period of leave of absence, and equally against the lowering of salaries, no matter what the position of the White Man may be, whether Governor, Government Official, Army Officer, or Trader; all that Europeans get in remuneration they deserve, and no one with a fair mind, and a knowledge of the health wreckage going on, can, in my opinion, argue for clipping off existing compensations, but I am quite persuaded that health and also social conditions of life will so change that there will be a decreasing necessity for present rules of high-rate salaries, and long leave-of-absence.

I quite expect to be laughed at for anticipating the day when it will be as safe and felicitous to live in Sierra Leone as it is now to live in England, but it is a prophecy only needing the work of time to fulfil.

An African's horror of the English climate in the winter season exhausts his power of description. To support this, to us, amusing view I may point out, that our own country in the past (throughout the whole of any year) proved deadly enough, before the laws of present day sanitation were exercised, and most people of fifty years of age can remember hearing of some panic, due to epidemic diseases doing their dire work.

Our forest and marsh-land tracts of country killed off people with the deadly certainty just as miasma does nowadays in the Tropics.

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* Bishop Smithies.

In England the past is left behind and we are developing a glorious inheritance of health, and its attendant benefits for which a hard struggle has been made by reformers in hygiene and sanitation.

What has happened here, will assuredly happen there, and my regret is that I cannot live to see the consummation of changes that are coming.

When I first knew Freetown there was no Hill Station such as we have now, and officials were cramped up together in the City with but few opportunities (and those very poor ones) for recreation, then, men "stewed" in the heavy night air, and more drinking and gambling went on than those who cared for such things, either themselves desired as a pastime, or found conducive to length of life, but such people were the victims of circumstances and found that the curse of their residence in Freetown was not so much due to the actual climate as to the want of something wholesome and recreative to do, and many men of firm will, joined with a vigorous constitution, became reckless as to health from sheer monotony of existence, and so increased the death roll.

That is now changed, or changing—the sanatorium known as Hill Station is in a delightful situation and here officials gather together after business hours, and laying aside the strain of differences in office-status, fraternise together in games of tennis, croquet, and other outdoor games.

Charming gardens are cultivated and the scenery is majestic to a degree, eliciting wonder and admiration from even dull minds.

Here too, many ladies grace the social life, which seems to assume a "Season" during the months of dry weather, and an air of homeliness salutes a new recruit so that he enquires as to what is wrong with the locality.

In the morning, the European descends to his trying duties re-invigorated. He is worth more as a human machine than when he left his office the previous night.

Scarcely five years ago, the same man was so situated that I venture to think he was worth less every morning than when he left his sphere of work over-night. The atmosphere in Freetown was always a tax upon a white man's nervous system. The heat, the harassing mosquitoes, the noises from surrounding houses, the cess-pits, all added something to the slow process of destruction.

Some four or five years ago, I joined a party of officers, most of whom had special medical research work to do. It happened that I had not infrequently puzzled my mind to know what people really meant by their sweeping denunciations of the Coast-climate, so I asked the question "Who can define the term climate? When we discuss it, what are we exactly talking about."

The reply to my enquiry, from the senior officer present, was this: "If Canon Smith will leave the room, I will define the climate."

More harsh adjectives are spent upon mal-descriptions of the Coast, and particularly Freetown, than the wide world dreams of.

What Manchester needs to know is that matters of health are amenable to treatment. Only a few years ago and previously the water supply of Freetown was derived from yard wells which were in close proximity to cess-pits of indescribable uncleanness. For the past five years there has been a pipe supply of splendid water laid on in the streets, so that an old source of danger has been relegated for ever to past history.

Many of the cess-pits are still there, and the greatest misfortune to my mind, in the town and village life of the Colony is that the people (regarded in the mass) prefer to have it so.

I have been much, and continually surprised at the seeming fatalism of the majority of the Natives, some of them otherwise most intelligent as logicians, who attribute death overtaking man or woman to the supposed fact that their "time had come" and no intervening influence, or course of action could avert the bereavement. No allowance appears to be made for the working of natural causes. The mischief exercised by mosquitoes is frankly scoffed at, as if it were the mere brain invention of officious fools.

The result of such wilful ignorance is that medical officers who give good advice, find that advice set on one side and ineffective even in the hands of a wise and masterful Governor.

We govern those whom Providence has placed under our care, with a tender regard for their idiosyncrasies and prejudices, and while this has its admirable, it also has its baneful side.

Some while ago an effort was made to get the people to accept some sanitary reforms, including the clearance of yards, but the population shewed fight and would have none of it.

In Konakry (French Guinea), severe measures used to be taken against those who left old tins about for mosquitoes to breed in, or rubbish to ferment and poison the air; in Freetown, by comparison,the yards were and still are disgraceful, with of course, many commendable exceptions.

Who is really to blame I do not know, but it is evident to anyone that neither the Imperial nor Municipal officials can effect this most needed reform unless the people willingly cooperate with those who set forth information vital to the communal health.

It is enough to say that reform is in sight. Incinerators are in daily operation throughout the town fulfilling their cleansing work; the people have been alarmed by the enforcement of Quarantine rules, rules which stop the wild spread of yellow fever, but also the freedom of trade, a matter which the native mind quickly appreciates, and as a result something is now willingly done to restore the health possibilities which past supineness and ignorance have anon destroyed. Syrian immigrants (who are notoriously filthy) are compelled to amend their ways, and in a manner, slow but sure, all classes are accepting the new idea that Freetown can be made, not (it may be) a popular health resort, but tolerable, safe and even attractive.

When Sierra Leone can be indicated as a country, healthy though tropical, we shall very rightly regard it as an asset of the Empire of greatly enhanced value.

In 1836, Rankin wrote concerning the Colony: "White strangers are not induced to select Sierra Leone as a watering place, or for a summer excursion," and the satire still holds good.

The same writer referred to the fact then true that "the white men were chiefly bachelors" and he goes on to speak of "the tone of Society being affected by this circumstance." It would seem by the context that some ten or twelve ladies recorded the total numbers of those who throughout a period of forty years had (as he puts it) "the heroism to accompany their lords to this part of Africa," and he had never met even so many as four ladies at any one gathering, "even at parties at Government House," and only one unmarried white lady throughout Sierra Leone.

That is altered greatly, so much so that it requires some care to count up accurately the total number of white ladies who come and go within the course of a year. All this, however wide of the mark it may seem, goes to shew that the conditions of life are undergoing a steady change, and cohesion to English institutions of marriage and civilization incline to throw back an old and bad reputation into oblivion.

In 1836 it was consistent for Rankin to write the following passage:—He said, "The position of the White Colonists will be easily understood. Beside the merchants, not amounting to perhaps twenty, every European wears the gold brocade or the button of office, attracted by the very high emoluments accorded to the service in what is considered an unhealthy climate, they pass a few years in the Colony uninterested in its permanent prospects, unaffected by its progressive improvement."

I assume that it will be recognised that what has done so much to hinder the success of the Colony is the climate difficulty, and now that sanitary reform is on foot, for the purpose of annihilating fever, and also social brightness gives promise of continual extension, this particular type of hindrance to progress, will be, to a very large extent, removed.

I must now call attention to the native element, for the Black man is of great importance as a customer for the goods which we manufacture, and in himself he makes an important asset of the Empire. What the asset is worth to our trade, anyone who likes may discover by means of the Blue Book which gives the Revenue Returns.

In years long since past (and we hope forgotten) he was marketable in the same sense that cattle are to-day, then the slave trade was as respectable as the banking business of our own time, and no less a person than Admiral Sir J. Hawkins landed in the Colony, and "after perpetrating every atrocity that civilization could suggest, captured some hundreds of the natives, put them on board his vessels, and afterwards sold them as slaves for his own advantage."

Originally the place boasted only twenty-five houses, and it is as recent a date as 1793 when a trading company obtained by treaty a few acres of land which provided the nucleus foothold upon which the present population of some 40,000 have made a dwelling-place.

Herein is a nice calculation for some curious mind to make, viz., if in one hundred years the population has risen from, say, one hundred persons to 40,000 what may it be assumed to attain to within the next hundred years. The question is proper to my subject, for we now generally recognise that every human unit has some economic value, something (however little it may be) to add to the force of business enterprise, in other words, every subject who dwells under the British flag is a customer for our manufactured goods, and it is profitable for us to encourage growth of population where expansion of numbers is safe and desirable.

Africa has room for millions of people more than now exist, and we have almost everything to gain and nothing to lose for our commerce by swelling numbers.

We have to study the African rather than despise or laugh at him.

He is undergoing evolution processes and we must allow for that with philosophic patience, doing our part to help, in the spirit of kindliness. Some workers for the good of Africa and her people have been most unfairly maligned for the presence of certain factors of evolution natural to the African mind.

The youth who aims at imitating the governing race is a laughing stock for many.

No European, I am confident, has mis-used his time to the extent of teaching a native that it is right to order wedding dresses from Paris, or to clothe himself in a tall hat, frock coat, kid gloves, and trousers falling in wrinkles over polished boots.

Tall hats are worn by Governors of Colonies, and the African instinct is towards imitating the highest officials, he is gregarious in habit, and likes to keep in the fashion, so much so that he differs from the fashionable men and women of the white race not so much in spirit, as in knowledge and opportunity to buy and display.

What is the meaning of this to the members of the Manchester Geographical Society? Why just this, that here we touch a valuable topic for a trade community to consider.

We discover that the naked savage is anxious for garments, he aspires to become a city man with the accompaniments of civilization. To attain to the fulfilment of this he feels obliged to work in order to acquire money, for without money he cannot buy. An African will risk much for the glory of clothes and once these are obtained he desires a box, and for the box, a house, and for the house additional comforts until at last some are purchasers of luxuries denied to many a well-to-do white man. I have heard of a Trader who had a room packed full of tall hats, which would not sell because the wearing of this head gear had been laughed out of fashion.

Fashion, even in Africa, opens a door for the incoming of new designs and finer materials, and also an enlarging sense of refinement in the choice of wearing apparel. I suggest that we are guilty of strange folly if we allow the undisciplined vanity of the African to annoy us, or arouse in our minds undisguised contempt for him on that account. Hats are articles of commerce, and if the hat be a tall one it costs more than other types, and there is no vice inherent in its kind. I had a servant boy whom I wished to send in a great hurry to overtake another boy, and in reply to directions to hasten, he said:

"I cannot go, sir! I cannot find my cap."

I then said:

"What do you want with a cap, are you afraid of the sun?"

"The sun! oh no, sir, an African does not fear the sun, but did you ever see anyone in the street without a hat?"

I was taken aback, I had not noticed until then, that it was almost impossible to see anyone without some sort of head-gear, even the most degraded wore something as cap or hat.

That is a curious thing, and suggests to us that the up-country savage will as surely become an idolater of clothes as the Piccadilly lounger. Through the channel of human vanity and human love of something better, if such can be obtained, the revenue of Sierra Leone will advance by leaps and bounds, and accruing results should come to the profit of English exports and imports.

One of the most remarkable facts about the West Coast is that Sierra Leone provided the first railway in its history, and that was begun no longer ago than 1898. Since then railways have been laid down in many places, and a complete alteration is quickly and swiftly going on in the economic value of our West Coast possessions. Our own Sierra Leone railway is justly called a tram line, but notwithstanding that, the produce brought by its means into Freetown for shipment, and trade goods sent back in return, offer high promise to the future prosperity of the land. We must not forget that the up-country is in a condition not far removed from Adam and Eve simplicity, and when the machinery of civilization really gets to work the change will be astonishing.

This railway matter is chiefly responsible for my subject—it dictated the idea to me. In all our Coast possessions we are laying down rails in haste, partly for strategic, partly for commercial purposes, and the changes since the Ashanti expedition under Sir Garnet Wolseley and the government of Sir Frederick Lugard in Nigeria, flavour of the miraculous.

It is known that forests and plains abound in natural wealth, but it cannot be conveyed to our ports, and therefore lies useless. The assessable value of Coast territory will change incredibly when the plans of engineers have matured and free communication is established.

Something, however, is coming to pass of which no one speaks for fear of being thought wildly optimistic, or more likely because the thing is beyond the vision of most men. We have accepted the fact of linking North and South Africa by means of the Cape to Cairo Railway, but we have not yet begun to think of another link that in my opinion must inevitably come about.

The harbour of Sierra Leone is easily the best on the West Coast of Africa, while the harbour of Mombasa is easily the best along the East Coast, and a growing need will be to link these two water-basins by a trunk line across the Continent.

I maintain in my own mind that even International jealousy will incline to give way before the practicability of this route, because it will make a good short cut to the Orient without, so far as I can see, hazarding the possessions of either France or Germany. We are witnessing a new thing in the world's history, viz., a rapid unification of the peoples of the earth in directions which diminish the risk of war, and increase the value of land for purposes of commerce.

I believe that the linking by rail service of America, North and South, and the completion of the Panama Canal, will open out new transit necessities, in with which Sierra Leone must join as being the nearest important mainland harbour to the streams of commerce, which shortly will begin to move.

Should the visions of a few expectant minds of our day precede the practical experience of generations as yet unborn, then those generations will find out that Sierra Leone is an asset of the British Empire beyond estimation in terms of money.

BRITISH COTTON GROWING.*

By J. Howard Reed, F.R.G.S., Hon. Secretary.

(Addressed to the Society in the Geographical Hall, on Tuesday, November 1st, 1910.)

"Year by year we are gradually approaching a very serious crisis, as the shortage of cotton is regular and progressive, and unless supplies of raw fibre are obtained from other fields than those of America, the Lancashire industry will not only gradually languish and decay, but will completely perish. For this reason it has become all-important that the industry of cotton-growing in British colonies should be fostered and developed, and if the effort is not absolutely successful within a few years, the great staple trade of Lancashire is doomed."

The statement just quoted was made in the course of an address I had the honour of delivering before Section E (Geography) at the meeting of the British Association, held in Sheffield in September last. The vast importance of the subject, and the extreme gravity of the pronouncement made, excited comment throughout the Press of Great Britain, and the statement was referred to by newspapers published in our great Indian dependency and in the Colonies. In no case that has so far come under my notice has any exception been taken to the sweeping pronouncement, and I think, therefore, that I am justified in believing that its general accuracy is accepted by those best qualified to judge.

In this address my main purpose will be to consider the geographical aspects of the problem of cotton-growing within the Empire, but I may, perhaps, first be permitted briefly to call attention to the main factors which have produced the present situation, and made the production of raw cotton within British dominions all-important.

Not many years ago the cotton crops of the world were quite sufficient, season by season, to meet the whole demand of the cotton-spinners, with a margin of surplus, which tended to keep the price regular and reasonable. At that time Lancashire to all intents and purposes manufactured cotton goods for the world, the whole output of other countries being comparatively unimportant. Then, as now, the American cotton-fields supplied about 80 per cent. of the raw cotton required in Britain, all the other cotton-fields of the world contributing between them the other 20 per cent.

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* We are indebted to the British Cotton Growing Association for the views illustrating this paper.

Even so recently as the season of 1882–3 the crop of American cotton reached less than seven million bales, but this, supplemented by the smaller crops of other countries, was sufficient to meet the combined demands of the mills of Great Britain, the Continent of Europe, and the United States, and to supply a surplus of about a quarter of a million bales. While these conditions prevailed the price of cotton remained fairly constant and reasonable, and the panics of recent years were scarcely known, and never so serious as now.

The demand of Britain for raw cotton is no greater to-day, but slightly less than it was, say, twenty-five years ago, and the weight of the American crop has steadily increased in the meantime.

In this connection it may be mentioned that while the crop of cotton produced in the United States in 1882–3, as just stated, reached less than seven million bales, it had by 1892 increased to over nine millions, and ten years later it reached ten and a half millions, while the crop of 1908-9 totalled over thirteen and three-quarter millions, although it fell back again last season to not much over ten and a half millions of bales. Notwithstanding this fairly steady increase, however, we find that the condition of "shortage" is, generally speaking, getting worse, and has now become almost chronic: so much so, indeed, that the price of the raw commodity has advanced practically to double what it was not many years ago. The difficulty is intensified by the opportunity which "shortage" affords to gamblers across the Atlantic to "corner" the supplies, and to further force up the price ; and of which opportunities the gentlemen referred to do not fail to take full advantage.

If, as has been previously stated, the British demand for raw cotton has slightly decreased during the past twenty-five years, while the American crop, and the total of the world's production, have been steadily increasing, how, it may be asked, is it that cotton users are so seriously suffering from "shortage"? In reply it may be concisely stated that the trouble is due to the enormous growth of cotton manufacture in other countries, which has produced a hunger for raw fibre which cannot now be adequately satisfied.

This will be perfectly clear when the following figures are considered. In 1891–2 Britain, to supply her spindles, used 3,181,000 bales of cotton, the continent of Europe 3,640,000 bales, while the mills of the United States required only 2,431,000 bales. Last year (1909–10) Britain used 3,053,545 bales (which is 127,455 bales less than the 1891–2 figure), Europe 6,186,930 bales, and the United States of America used 4,707,000 bales. In other words, during the eighteen years under consideration the demand of Britain for raw cotton has fallen 4 per cent., while on the continent the call for fibre has increased during this period 70 per cent., and this on a figure which at the earlier period referred to was already half a million bales larger than that of this country. In the United States the demand has increased by no less than 90 per cent. within the same period. If taken a year earlier, the figures are even more startling. Then Great Britain showed a decrease of only 1 per cent. during seventeen years, but Europe and the United States showed an increase of 75½ and 109 per cent. respectively.

The fall during the last year quoted was doubtless brought about by the smaller crop and a consequently enhanced price of raw cotton, by a general slackness of trade during that season, and more especially by the organised scheme of short-time working which has been more or less generally adopted by the cotton manufacturers of the world.

The American fields, for reasons which we cannot deal with here, cannot be expected to keep pace with the increasing demands of the cotton-using world. It is fairly obvious that, if the requirements of the American mills continue to increase as they have in the past, it will be the countries on this side of the Atlantic that will most severely feel the pinch of "shortage," as naturally the home mills in the neighbourhood of the native cotton fields will have their needs supplied before the manufacturers in the Eastern hemisphere get a chance.

The other well-established though much smaller cotton-fields of the world are even more impotent to prevent "shortage." The fields of India, for instance, which rank next to those of America, and have an output of between four and five million bales of fibre, produce a short-stapled variety not of much use in this country. About one-third of the Indian crop is used in the home mills, large quantities go to Japan and

Germany, and the remainder, in comparatively small consignments, is sent to the other countries of Europe, including Great Britain.

The cotton produced in Brazil, Peru, Mexico, Asiatic Russia, China, Japan, and Korea is almost wholly absorbed locally, and many of the countries mentioned also import considerable quantities of fibre from America and India. Japan, for instance, last year consumed 130,000 bales of American cotton in addition to 914,000 bales of Indian.

No great increase is to be expected from Egypt, as the land available for cultivation is very limited, and even with the irrigation works completed, the increased acreage available for cotton will be small. Indeed, as has been pointed out, cotton-growing in Egypt proper has practically reached its limit.

Enough has probably been said to emphasise the now well-known fact that there is a great need for increased supplies of raw cotton being obtained from somewhere, and to satisfy us that there is very little prospect of this increase being obtained from the present well-established cotton-fields of the world.

It was the gradual realisation of the facts just stated, brought about by careful study and inquiry, which led to the formation of the British Cotton Growing Association. I do not propose to describe in any detail the work undertaken and accomplished by this Association, but I may perhaps be permitted to say that its operations have been of a most satisfactory character. Though handicapped by lack of enthusiasm, and a very tardy supply of the comparatively small financial assistance asked for, it has performed a monumental work, and its founders and supporters will deserve all credit when the great problem of Empire cotton production has been solved.

Before attempting to describe what has actually been accomplished in the matter of cotton cultivation in British colonies, or dealing with the future prospects of the all-important project, it may be useful to consider some of the main facts and conditions upon which the success of the movement is dependent.

It is quite well known that what may be described as the cotton-growing belt embraces all the land areas falling within a zone extending between 40° N. and 40° S. of the equator. This region, it will be observed, embraces practically the whole of the British Empire except Canada, Tasmania, and part of New Zealand, and quite obviously gives enormous scope for the

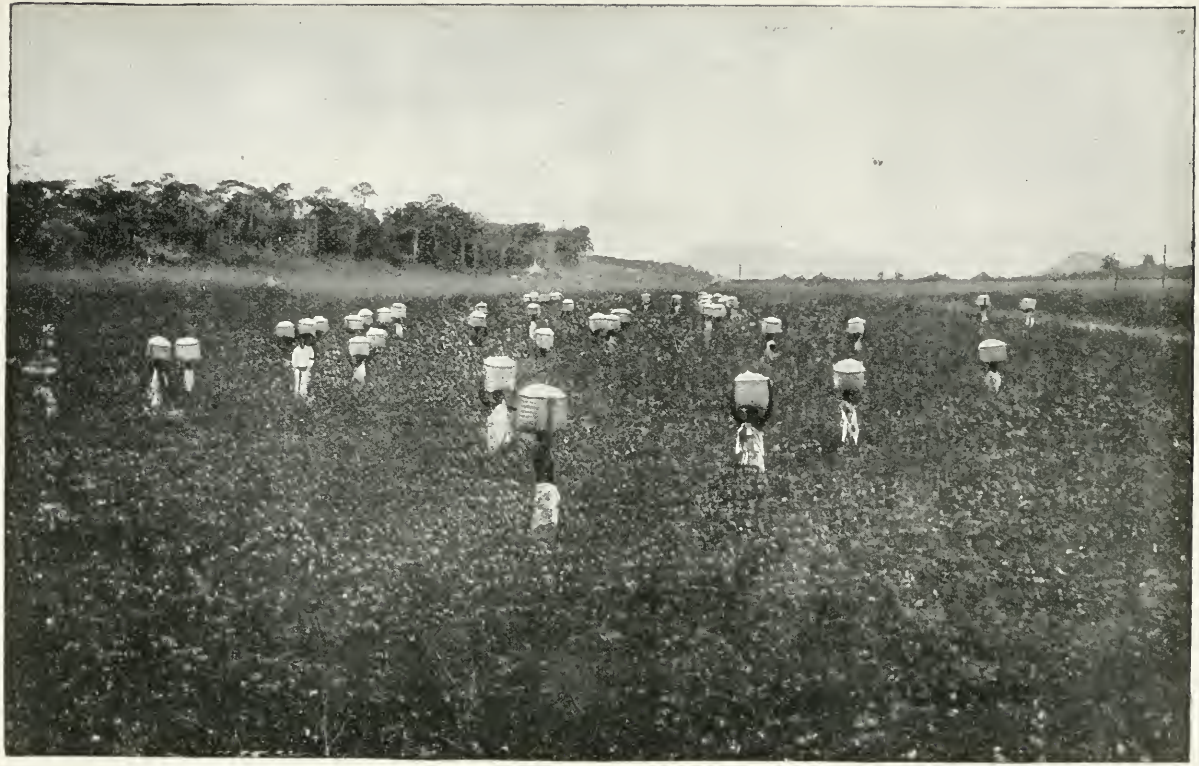

Fig. 1. Nyasaland. Cotton field on the Bruce Estate.

possibilities of cotton-growing in British Dominions; seeing that the zone includes the whole of the tropical and semi-tropical possessions of the Empire.

There are, of course, many conditions besides latitude upon which the successful growth of cotton depends. The soil must be suitable, the rainfall sufficient, or irrigation at reasonable cost possible.

In the American fields various types of soils exist—clayey, loamy, and sandy, or combinations in varying proportions of any two of these—and each of them, when properly dealt with, is found suitable for some particular variety of cotton plant. It is evident that if all these various kinds of soils have been found more or less suitable for cotton culture in America, that similar surface conditions within British territories will be equally suitable, provided that other necessities are likewise obtainable.

Professor Dunstan, the well-known authority on these matters, speaking of the British territories which fall within the cotton-growing zone, says: "The rainfall in most of these countries is adequate, and in those in which it is deficient, irrigation is possible in nearly every instance." He goes on to say that: "Records of temperature and rainfall being available, the suitability of the climate for successful cultivation can be readily gauged, and the best time for both planting and gathering of the crops determined." He remarks that: "The suitability of the soil is more difficult to determine, especially in relation to the necessity of manuring, and to the proper rotation of crops." This, however, is, after all, a matter of detail, with which it is not necessary to deal until a special inquiry with regard to the suitability of some particular area, with a view to cotton cultivation, comes under consideration.

The varieties of cotton which are suited to particular regions is a very much larger question; but this, again, only needs to be closely considered when the general suitability of some district has been determined, and can in most cases be best settled within a few seasons by actual experiment with different kinds of seed, and methods of manuring, planting, watering, etc.

The world produces cottons of what may without exaggeration be described as unnumbered varieties—there are, it has been stated, no less than 130 kinds of American cotton. A seed which produces a plant and fibre of certain definite characteristics when grown in a particular way in one country, produces a more or less modified result when treated in another manner, or when cultivated under varying conditions in some other part of the world. Although this is so, the various kinds have, I believe, been classified into six general species, all the innumerable varieties falling somewhere within the scope of one or other of these.

The six classes referred to are as follows:—

1. *Gossypium Barbadense*, the well-known silky and long-stapled variety known generally as the sea-island cotton of America, which has been improved under the special conditions in Egypt into the very valuable variety for which the land of the Nile is famed. It is indigenous to the West Indies, and is said to have been introduced into the United States from Barbadoes, from which island its name is evidently derived. The cotton-fields of the United States bordering the sea-coast produce large quantities of this particular fibre, hence the name —sea-island cotton.

2. *Gossypium herbaceum*, more or less indigenous to India, China, Asia Minor, and Africa, and probably originally derived from the first-named country.

3. *Gossypium hirsutum*, so named from the hairy character of every part of the plant, which is believed to have been originally native to Mexico. It is now found in practically all sub-tropical regions.

4. *Gossypium arboreum*, a tree cotton, as its name implies, grows to as much as 20 feet in height. It is indigenous to India and the borders of the Indian ocean, and yields a fibre of short staple.

5. *Gossypium neglectum*, which produces a short-stapled white fibre of somewhat harsh character. It is native to India, and grows in the form of a low kind of bush, less than 2 feet high. It is of great commercial importance to India, as it is produced in large quantities in the Punjaub, and the North-West Provinces, and contributes the largest share to the cotton grown in the Bengal Presidency.

6. *Gossypium Peruvianum*. This, as its name suggests, comes from Peru. It is largely cultivated in that country and in Brazil, being grown both as a tree and as an herbaceous plant. What is known as kidney-cotton, so called from the shape and arrangement of its seeds, belongs to this species.

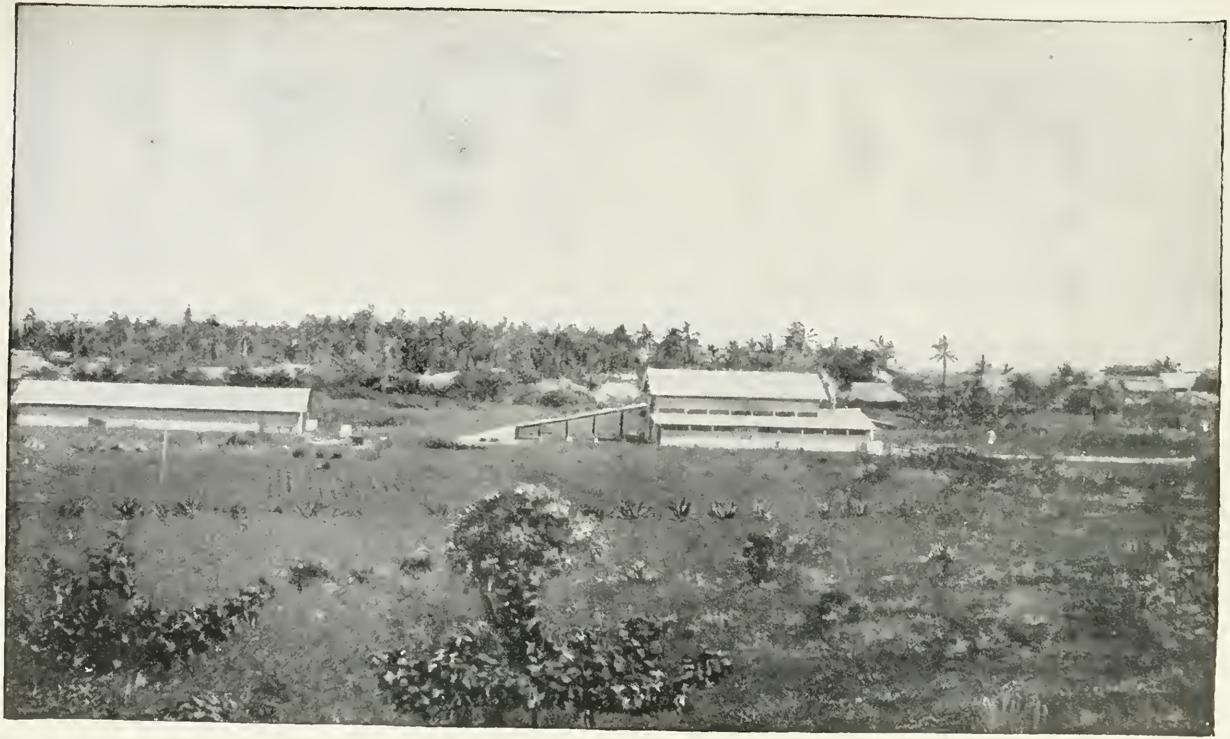

Fig. 2. Malindi. View of the Ginning Factory of the British East Africa Corporation.

Doubtless, when cotton has been cultivated on scientific principles and under the guidance of experts, in our various colonies, new varieties, especially suited to chosen districts, will be developed which will give the most certain and useful results obtainable in those particular areas.

There are many conditions, it need hardly be said, besides those which have been already briefly referred to, upon which the success of cotton-culture within the British Empire will depend. A sufficiency of suitable native labour will be of paramount importance in the development of Imperial cotton-fields, and the particular conditions, habits, and racial aptitudes of aboriginal tribes will have an enormous bearing upon the whole subject.

Means of transport and communication will be a primary condition essential to success, as it is manifest that, however good or plentiful the product of any special district may be, such produce will be an absolute drug in the market unless it can be readily and cheaply transported from its place of origin to the markets where it is required. For this purpose it will be necessary for the extension of railways, the construction of roads, the building of bridges, and the organisation of river and lake transport to keep pace with the progress of the cotton-growing industry in the at present undeveloped colonial areas. Many of the points so briefly referred to will come more or less under notice as we deal with the various districts where cotton-growing is already making more or less satisfactory progress.

During the past eight years the British Cotton Growing Association, as is well known, have been devoting themselves assiduously to the encouragement of cotton production throughout the British Colonies. Their operations have embraced extensive inquiry, energetic experimental work, and widespread financial assistance, the whole of the branches of their great effort having been distinguished by business-like intensity of purpose. In some fields disappointment has been met with, while in others great encouragement and success have resulted.

The Association has all along been more or less held back by financial considerations, and there is little doubt that had the capital they originally asked for (£500,000) been forthcoming at an earlier date, they would have accomplished more. In an appeal made to the public a year ago, the Association stated that their "pioneer and initial work" was "practically finished," they having "proved beyond dispute that cotton can be grown within the Empire on a large scale, and on a commercial basis." They stated further, that they had "decided to concentrate their main efforts on Nigeria, Uganda, Nyasaland, and the West Indies."

This seems to be a wise decision, not because other parts of the Empire give no encouragement, but simply because the four districts selected show more immediate promise of real success. When the work of cotton-growing has been fairly well established in these fields, the concentration of effort can be relaxed, and more direct attention be given to other regions. It will be worth while to devote some little special attention to the four districts just referred to.

The reports of the progress of cotton cultivation in the West Indies are satisfactory and highly encouraging. A century ago the production of raw cotton in these islands was a considerable industry, and somewhere about 70 per cent. of all the cotton used in Great Britain was at that time obtained from there. Later on, the competition of the American fields gradually forced the West Indian planters to turn their attention more vigorously to the production of sugar and other crops more profitable than cotton, the cultivation of which, as a consequence, diminished and afterwards practically ceased.

Since the Cotton Growing Association commenced their work the industry has been re-established, and now gives much promise for the future. The cotton grown is that known as sea-island, which has been re-introduced from the islands off the coast of South Carolina. It is of interest to remember that in all probability this plant was first introduced to the American fields from the West Indies, its botanical name (*Gossypium Barbadense*) suggesting that it came originally from the island of Barbadoes, where to-day larger quantities of this particular variety are being produced than in any other island of the West Indian group.

The colonial authorities have given much attention to the re-established industry, Sir Daniel Morris, K.C.M.G., late Imperial Commissioner of Agriculture, having strenuously devoted himself to the work. Since the revival, the exports of cotton from these islands have steadily increased year by year, while the acreage devoted to cotton crops has been regularly augmented. In 1902 cotton fibre and seed worth £9,676 were exported, but this has now increased to a value of £250,000, there being no less than 30,000 acres under cotton crops. It

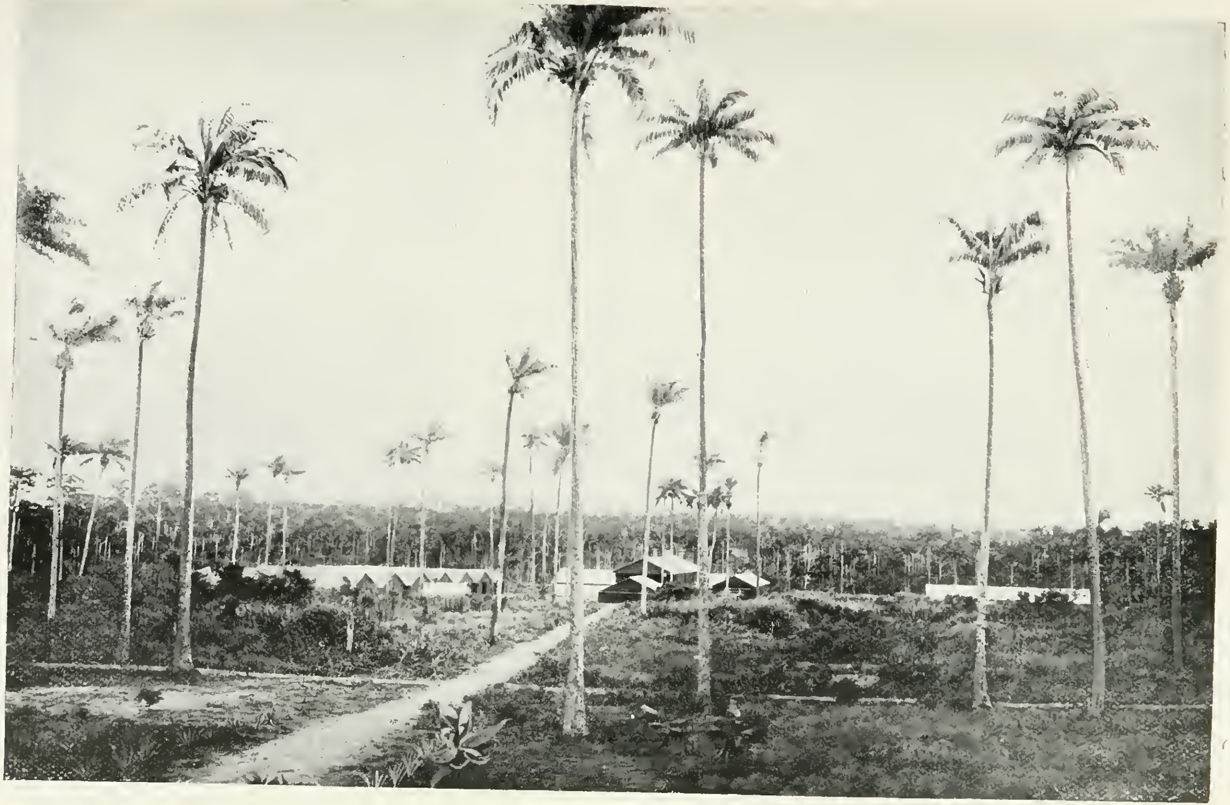

Fig. 3. Oshogbo, Lagos. General view of the Alfred Jones Ginnery.

has been found by experience that cotton is a crop which can be grown in rotation with sugar-cane with satisfactory results.

In addition to the cultivation of the high-class long-stapled sea-island cotton, the colonists have also experimented with other varieties with considerable success. Some of the islands appear to be better suited to the growth of "second" and "third" class grades of cotton, and these find a ready market. The planters of the West Indies have been spoken of in high terms by Sir Daniel Morris, who is evidently convinced that they are devoted to the re-established industry.

It should be remembered that, although most satisfactory developments may be expected in these colonies during the next few years, their opportunities are naturally limited. The whole area of the islands is only some 12,000 square miles (twice the size of Yorkshire), while the population is only about 1,500,000.

Africa probably affords the greatest hope we have for large supplies of all the varieties of raw cotton which are most in demand in this country. One is impressed with the fact that the rapid development of British colonies within the tropical and semi-tropical portions of the great "dark continent," has only really commenced, just at the time when their vast natural resources are likely to be most in demand. It certainly seems as if Africa is destined in the future to provide this country with vast supplies of raw materials and food stuffs, and at the same time supply important new markets for the benefit of our manufacturing and commercial districts.

From the point of view of cotton, no portion of Africa gives greater promise than does that area which contains the whole of our West African possessions. We have here large areas of territory which possess a soil and climate specially suited to the production of cotton, and where, indeed, an extensive native cotton-growing industry has been carried on, probably for many hundreds of years. These districts, too, are densely populated by peoples identical in blood and race with those who are the successful cotton cultivators in the United States. Indeed, it is not improbable that the earliest cotton-fields in the West were those which the slaves from Africa started with the seeds they had brought with them when dragged across the seas to the western plantations.

The ports of British West Africa are in many cases old-established centres of trade, provided with wharfage and other commercial appliances. They are as well within touch of British ports as are the West Indies or the American cotton States, and possess a native trading population whose natural commercial instincts have been well developed by being for generations in touch with British traders.

It may be remembered that cotton-growing for export is not altogether a new industry in West Africa. At the time of the great cotton famine, Lagos, like the West Indies, did something to help Lancashire. In the year 1869, raw cotton to the value of nearly £77,000 was exported from this one colony. American competition killed the industry, and we find that ten years later the export had dropped to a little over £500. Recent experiences, however, have shown that the possibilities of West Africa are most encouraging. Each of the West African colonies has done something in the way of cotton production during the past few years, and all of them, with the exceptions of Gambia and Sierra Leone, give considerable future promise. The colony of Lagos has been the most progressive of the group from the cotton point of view, and during the season of 1909 provided no less than 12,000 bales of fibre out of 13,200, which was the West African total for that year.

The British Cotton Growing Association has expended much money and effort in these colonies. Seed of selected varieties has been liberally distributed, ginneries have been erected and fully equipped, buying agencies have been established, much experimental work has been carried out with a view to improving the cotton fibre produced, and all kinds of encouragement have been given to the local cultivators in the hope of establishing a native industry on satisfactory commercial lines.

The local authorities, with the approval of the Colonial authorities, have done all possible to foster the work and back up the efforts of the Association. Money has been expended in the construction of railways and the general improvement of communications, in the development of experimental farms, and, not least, in pursuing measures of government and administration which have established peace and contentment among the native peoples.

In April least year the old arrangements between the Government and the Association came to an end, and a new and progressive scheme was established. By this agreement a sum of £10,000 per year for three years is to be granted from

Imperial funds, "the Association undertaking in return to raise a further £150,000 of capital; to continue the work already begun on a commercial basis; to erect and maintain for a period of three years seven pioneering, buying and ginning centres—two in the Gold Coast, one in Southern Nigeria, three in Northern Nigeria, and one in Nyasaland"; "to provide free of charge all seed for growing purposes in the Gold Coast, Southern Nigeria, Northern Nigeria, and Nyasaland; and to carry on travelling and missionary work among native cultivators in the Gold Coast and Southern and Northern Nigeria."

The work that has been done in West Africa, and the undertakings that are now in hand, tell a story of consistent and persistent effort, brimming over with interest and encouragement. The task to be accomplished, however, is so vast, and the ground to be covered so extensive, that much patience and earnest endeavour will be needed for many years to come.

Leaving the West African colonies, and turning to those on the other side of the continent, we find much satisfactory work in progress. In Nyasaland the story of cotton cultivation, so far as it has gone, is quite a romance. In the season 1901-2 experiments were commenced, and in the following year cotton fibre was mentioned as an export from the colony for the first time, but the consignment only reached the trifling value of £3. This at the time appeared so absurdly small that its mention only provoked a smile. The appearance of the item in question was, however, a much more important fact than was then realised, as it recorded the birth of a new, and what is now, an important industry.

The crop in Nyasaland, and the export of ginned cotton from the colony, has increased year by year, and has now reached encouraging proportions. In the season of 1908-9 raw cotton headed the list of exports in value, no less than £28,353 worth being exported in that year, while nearly 9,000 acres of land were under cotton crops for the next season's harvest.

At the end of August last it was officially stated that the cotton industry was "going ahead by leaps and bounds." It was expected that the area cultivated by Europeans, which was then 12,000 acres, would increase in the following year to over 20,000 acres. The native industry was increasing "even more rapidly," and may be expected to exceed the European acreage and output in a few years.

Different varieties of cotton are cultivated in this colony according to soil, situation, and height of the land above sea-level. What is known as Nyasaland Upland is a very superior type of fibre, and commands a better price than the same class of cotton grown in America. It has been reported to be "the finest cotton ever grown from Upland seed either in America or elsewhere."

The Government authorities and the Cotton Growing Association have worked together to encourage the industry, and their efforts, as we have seen, have met with considerable success. In the Nyasaland Handbook it is stated of cotton-growing, "the industry is thoroughly established and gaining in favour with Europeans and natives alike."

In 1905 a most valuable report was issued dealing in detail with the industry of cotton growing in this particular colony. It was the work of Mr. Samuel Simpson, a cotton expert, was written after exhaustive investigations made on the spot, and must be of much assistance to the local planters. Scientific work of this kind is being vigorously continued by the Agricultural Department, which has recently been enlarged for this special purpose.

The report of the Director of Agriculture for the year 1909–10 is full of the most valuable information on suitable varieties of cotton, blights and diseases which affect the plants, and how they may be avoided or mitigated, characters of the varieties grown, methods of selection, etc., and gives very distinct evidence of the helpful and stimulating service which the department is rendering to the colony.

Uganda, the remaining colony of the four upon which the Cotton Growing Association are concentrating their efforts, has proved a most satisfactory field. Hitherto the experiments have been mainly carried out by the Government, who have succeeded in influencing and interesting the native chiefs and impressing upon them the commercial value of the work. The result has been the establishment of a native cultivation which has very rapidly developed most encouraging proportions.

Some difficulty was at first experienced due to the ignorance and inexperience of the people, who mixed up different varieties of seed with disappointing results. The Government officials, however, adopted measures to regulate matters and supervised the disposal of seed and the distribution of that selected for planting. They also carried out "experiments with different

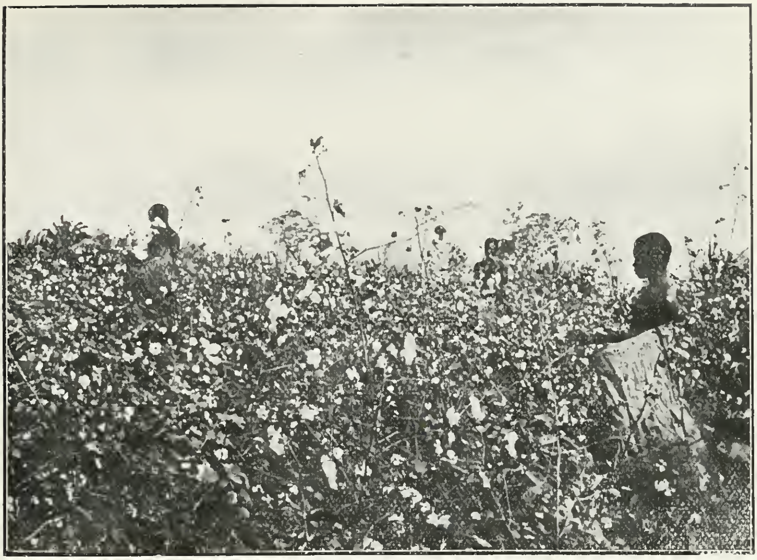

Fig. 4. Illushi, Southern Nigeria. Picking Cotton.

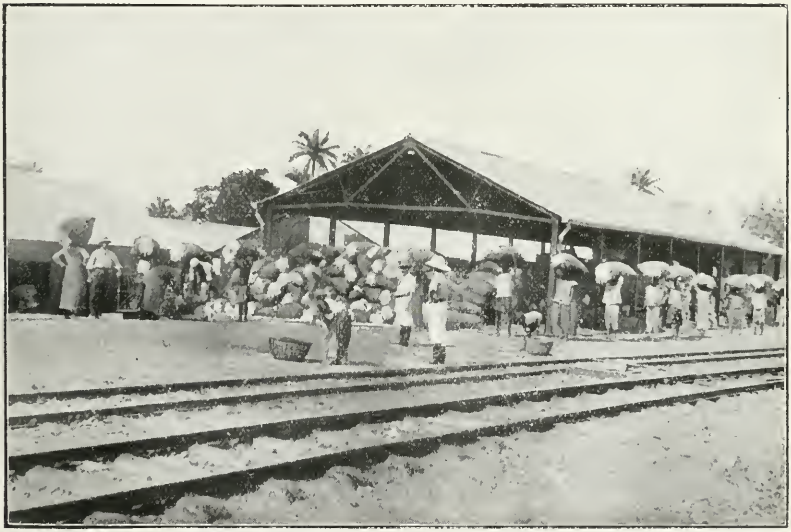

Fig. 5. Ibadan, Lagos. Natives bringing in seed-cotton to Marlborough Ginnery.

varieties of cotton, hybridisation, acclimatisation, and different methods of cultivation." A considerable sum of money has been expended in work of this kind, but the successful results which are now being obtained have fully justified the expenditure.

As is well known, the natives of Uganda are a far more progressive type of people than the generality of native African tribes, and this fact has doubtless much to do with the remarkable results which have been obtained. The late High Commissioner, Sir Hesketh Bell, K.C.M.G., has spoken in the highest terms of the progress and probable future of cotton growing in the Protectorate. "We have in Uganda," he says, "one of the greatest cotton-fields in the Empire." The country has "not only the soil, climate, and other natural conditions absolutely favourable to cotton growing," but also a population "eager" for that work. The natives, he states, are "so greedy of progress and improvement that they had almost to be restrained."

Within a few years the exports of cotton from this district have grown from nothing to a value, in 1908, of £50,000, and Sir Hesketh Bell has stated his belief that the industry will increase tenfold in a very few years. In order to keep pace with the progress and enthusiasm of the native cultivators, it will be necessary to extend railway and other transport facilities, and work of this kind is being pushed forward by the authorities. It is evident that Uganda gives great promise for substantial supplies of raw cotton for the future.

There are considerable areas within the East African Protectorate where the climate and soil are suited to cotton cultivation, and fibre of very superior character, judged from the Egyptian standard, has been grown. The Association have spent a good sum of money in stimulating the work in this district, and the Government have also devoted considerable sums to the effort. The crops a couple of years ago largely failed for reasons which cannot now be dealt with, and since then efforts have been relaxed and more attention been given to Uganda. The machinery sent out for Mombasa has instead been erected at Kisumu, on Lake Victoria.

Turning to the Sudan we find large areas of suitable land near to where the Blue Nile and the Atbara join the main stream of the Nile. Many years ago the late Sir Samuel Baker drew attention to this district and its suitability for cotton growing. He pointed out that a superior type of plant, giving a long-stapled fibre, was indigenous to the district, and he suggested that some barrage scheme which would store up the waste waters of the Atbara would render some thirty millions of acres available for cultivation. He pointed out that the seasons in that district were so certain that, to use his own words, "neither rain nor dew disturbs the dryness of the atmosphere, and the freshly gathered cotton requires no covering."

Lord Cromer, in his 1903 Report, says of the same district: "There can be no doubt that cotton of good quality can be produced in that country. The Sudan was, indeed, the original home of Egyptian cotton."

In the early days of the British Cotton Growing movement an American gentleman, Mr. Leigh Hunt, acquired a considerable tract of land near the mouth of the Atbara river, formed a syndicate, and commenced cotton-growing. Much success followed Mr. Hunt's experiments, and although three years ago that gentleman retired from the work, it is still being carried on with increased success. Sir William Mather, in an address on the subject delivered in October last in Manchester, spoke in the highest terms of the work already done, and of the great promise for this district in the future. He pointed out that at Zeidab, in the province of Berber, there were at present 3,000 acres under cotton crops, the same area under wheat, and almost as much under other crops used like wheat in rotation with cotton. The total area of the present concession is only 12,000 acres, but this will shortly be extended to 40,000 acres. The cotton crop was found to command better prices at Alexandria than "fully good fair" Egyptian fibre.

The Gezira plain, between the converging courses of the Blue and White Niles, forms a splendid field for the production of cotton, and is said to be capable of yielding a crop of best quality fibre of probably 700,000 Egyptian bales. The area of the plain in question is estimated at between three and four million acres, or taken at the lower figure, 4,500 square miles, which is equal to more than a third of the whole cultivable area of Egypt. Wheat of the finest quality can also be grown in this plain, so that two valuable crops can be grown in rotation.

The new railway from the Nile to the Red Sea affords facilities for transport. Barrage works will be necessary in

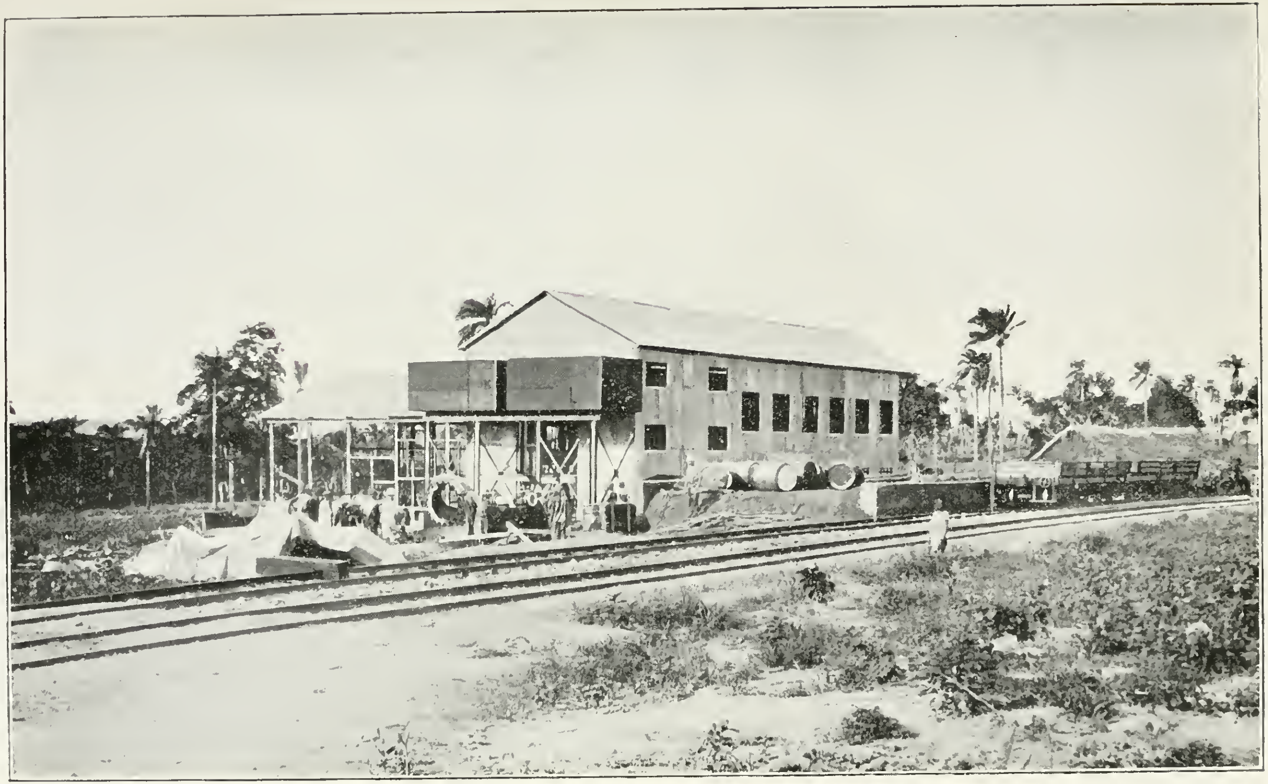

Fig. 6. Ibadan. Lagos. Marlborough Ginnery.

the neighbourhood of Sennar, and an extensive system of irrigation canals will also be required, but there should be no great difficulty in raising the capital for these in view of the natural assets which would by such means be made available.

South Africa cannot, so far as the main territories are concerned, be expected to supply much in the way of raw cotton, at any rate, for some time to come, although good samples of fibre have been produced in Cape Colony, Natal, and the Transvaal. Labour difficulties will be likely for some time to come to prevent any great development.

Rhodesia, however, gives much promise for satisfactory supplies in the not very distant future. Labour is likely to be found in sufficient quantities, and the climate and soil in several districts are quite suitable. It is believed that there are great hopes of a native industry being developed under European guidance, much on the lines of that in Uganda, Nyasaland, and West Africa, but although good samples of cotton have already been produced the industry is only now emerging from the elementary stage.

The South African Chartered Company have devoted a considerable sum of money to the development of this work, and they invited the Cotton Growing Association to give financial assistance on the same lines, and to undertake the management of a well-considered scheme. This invitation was accepted, an expert was sent into the country, and his reports were found to be so encouraging that arrangements have been made for the establishment of a buying and ginning centre at Kafue Bridge on the Rhodesia Railway, and every effort is to be made to establish the industry.

It will have been realised from what has been said that Africa promises in the future to supply a large share of the raw cotton which is required if the British cotton industry is to be saved from disaster, and from this point of view the "dark continent" has not inaptly been described as "Lancashire's hope."

Outside of Africa, and apart from the West Indian fields with which we have already dealt, there are large areas of the British Empire which can and do grow cotton, and which may be expected in the future to do something to meet the needs of the mother country. Time, however, will not allow us to do more than merely glance at these.

India and Ceylon will doubtless under special guidance and

Government attention do something to improve the general quality of the fibre they produce, but much native prejudice and natural conservatism will have to be broken down. The short stapled cottons grown by the native Indian cultivators give much heavier crops than the higher class varieties which are in demand in this country, and so far the native growers do not seem disposed to risk a reduction of quantity for the sake of better quality.

In the district of Sind cotton from Egyptian seed has been grown with considerable success. In 1909 some 2,500 bales (400 lbs. each) of this cotton were produced. The true secret of the production of a better Indian cotton seems to be the gradual improvement of the native seed by selection and special cultivation under the guidance of trained experts.

Some few months ago an influential deputation of cotton manufacturers and others interested waited upon Lord Morley and requested assistance from the Indian Government with a view to the improvement of the fibre obtained from the Dependency. No great satisfaction was obtained, although the Minister was most sympathetic. The requests made by the deputation may be summarised as:—

The establishment of cotton departments with suitable staffs in each Province. Concentration upon indigenous cottons. Selection of seed. Importation of fertilisers. Imperial financial grants in aid of the work.

Lord Morley pointed out that expansion of agricultural production could not be brought about rapidly; that the funds of the Indian Government are not unlimited, and that it would not do for the Government to concentrate its energies upon a single branch of production. He remarked that a Department could do a great deal less than was supposed, but it could do something, and he promised that that "something," whatever it might be, should receive the consideration of the Agricultural Department of India.

Cotton has been grown in Ceylon for a long time, but only in a primitive manner by the natives for their own purposes. The Government and the Cotton Growing Association have spent considerable sums of money in experimental work, and in the equipment of a ginning plant. If the authorities continue their efforts it is hoped that a useful native cotton-growing industry may be established in the north of the island.

The other possible British cotton countries are Australia,

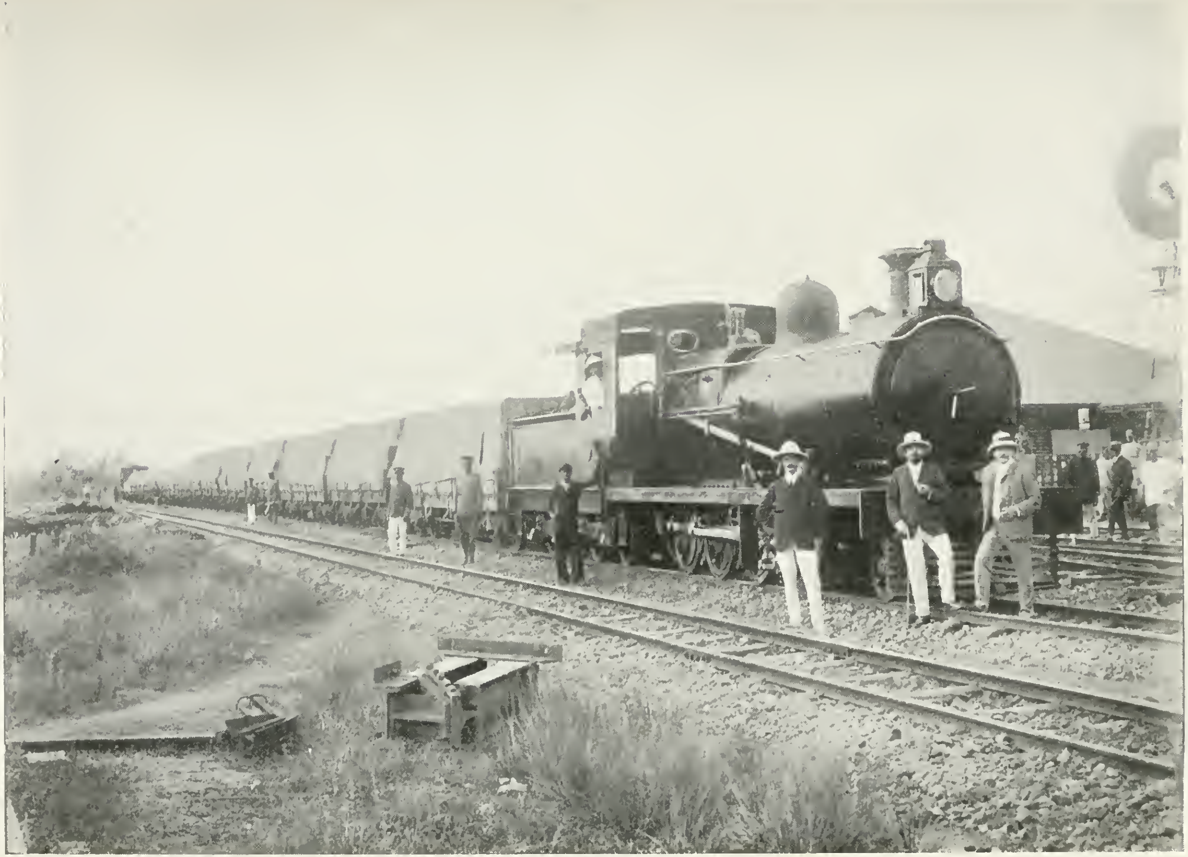

Fig. 7. Lagos. Cotton train on arrival at the Iddo terminus.

Borneo, Fiji, Straits Settlements, Malay States, the Seychelles, Mauritius, Cyprus, the Maltese islands, and St. Helena, but no great output of fibre is to be expected from any of these districts, at any rate for some time to come.

In Australia, the provinces of New South Wales, South Australia, and Queensland can all grow cotton of good quality, and the same may be said of New Guinea. No great progress with the industry has, however, been made, nor is such immediately likely, owing to the lack of suitable labour. At present the production of established and more remunerative branches of agriculture absorb all the available workers. Experiments, however, are still being carried on, and some cotton fibre is exported. British Borneo is, perhaps, a more hopeful field, as labour there should be fairly plentiful, and a native cotton is grown for local purposes which is said to be practically equal to that of Egypt, being of specially fine and strong character.

In the Fiji Islands good cotton can be grown, which is noted for its whiteness, long staple, and silky gloss. A generation ago a considerable quantity of fibre came to this country from these islands, and so late as 1873, about £93,000 worth of Fiji cotton was exported. The industry received much stimulus during the great cotton famine period, and a considerable quantity of sea-island fibre was grown. The return of peace and the resumption of cotton-growing in America caused the output to fall off, careless cultivation did the rest, and the industry practically disappeared. Recent experiments have shown good results, and past experience suggests some promise for the future.

In the Straits Settlements and the Malay States cotton has been cultivated, but with poor results. The climatic conditions are variable and unsuited to cotton, the plants are specially liable to suffer from many kinds of parasites, and the supply of labour is deficient. The natives of Mauritius and Seychelles grow cotton on a small scale for their own use. Samples of this have received approval in England, and there is hope that a useful output may some day be obtained.

The island of Cyprus is capable of producing a good variety of cotton, and in past years considerable cultivation was carried on, much fibre being exported to France and the Levant, and small quantities to England. Lack of water, poor seed, locusts, and general neglect practically destroyed the industry, but it was revived by the introduction of better seed and a system of irrigation. Under proper expert care the island may in time do a great deal to assist matters.

Malta, and St. Helena, although so far apart, both grow cotton of useful character. In each case, however, it is only at present grown to meet local needs, and although under suitable direction and stimulus the produce can doubtless be much increased, the possible area for cultivation is necessarily very limited.

From our general knowledge of this subject, and from our discussion of it this evening, I think there will be a general agreement that the problem of Empire cotton-growing is an extremely important one, and that the continued commercial prosperity of a large portion of this country is of necessity greatly dependent upon its solution.

I think we may further agree that various portions of the king's dominions are climatically quite capable of contributing something towards the large supply of raw cotton which we need, and that some of the colonies give distinct and hopeful promise for the future. The energetic operations of the British Cotton Growing Association have produced eminently satisfactory results. The work they have done has been of a most praiseworthy character, but after all what has been accomplished is extremely small compared to what is actually required, if the great cotton industry of Britain is to be saved.

We require three and a quarter millions of bales of raw cotton, each of 500 lbs. weight, every year to keep pace with the present demand of our spindles. During eight years the combined efforts of the Cotton Growing Association and the Government authorities in the various colonies have only succeeded in producing 116,700 bales of 400 lbs. weight each, which it will be seen is only one-thirty-fourth of what is required each season.

Something has been done, progress has been made, and the British Cotton Growing Association may be congratulated upon the good work they have accomplished. Much more, however, is needed, and if the problem is to be satisfactorily solved, all those interested will need to do their part, to do it at once, and with energy and persistence.

It has often been said in north of England circles that geography in Lancashire is spelt c-o-t-t-o-n; this may be so, but if it is, I would remark that so far it has only been interpreted as meaning the export of manufactured cotton. If, however, the industry is to be saved, it is necessary that not only Lancashire, but the whole country should realise that a wider interpretation is required, and that in this sense geography must also mean the importation of raw cotton.

So far, Lancashire and Britain generally have been asleep with regard to this great problem. For eight years the pioneers of the Empire cotton-growing movement have been appealing for half a million of money, and even as this is written, the sum is not complete. The money could, and should, have been subscribed within a few months at most. What is half a million of money in comparison with the salvation of an industry worth to the country over £100,000,000 per annum?

It is questionable if the expenditure of £500,000 is anything like enough to establish the industry of cotton-growing within the Empire, or whether a sum of £5,000,000 is not more like the figure required. Whatever the necessary amount may be, however, it should be forthcoming, and will have to be found. An increased supply of raw cotton is an imperative necessity, and it must be obtained, or the staple industry of Lancashire will decline and decay, even if it does not ultimately entirely disappear.

Proceedings of the Society.*

July 1st to December 31st, 1910.

The 857th Meeting of the Society was held at Finchwood, Marple-Bridge, the delightful residence of Mr. Joel Wainwright, J.P., on Saturday, July 16th, 1910.

A party of the Members, having accepted Mr. Wainwright's invitation, visited Marple-Bridge on the above date. They were met at the Station by Mr. Wainwright and his son, who, by special permission, led them through Brabyns Park. On arrival at the junction of the Etherow and Goyt Rivers, the leader gave a short geographical description of the district concluding his remarks with the following lines:—

> "There is not in the wide world a valley so sweet
> As that vale in whose bosom the bright waters meet;
> O! the last rays of feeling and life must depart,
> Ere the bloom of that valley shall fade from my heart."
> &c., &c.

Mr. Wainwright then led the party to Finchwood for tea.

Some photographs were taken and afterwards, with Mr. Harry Sowerbutts in the chair, Mr. A. Balmforth moved that the best thanks be given to Mr Wainwright for his leadership and hospitality, Mr. T. W. Sowerbutts seconded the motion adding thereto, with the approval of the mover, the names of Colonel Wainwright, Miss Winterbottom, and Miss Haworth to whose kind assistance some of the success of the visit was due. The resolution was carried with acclamation.

Mr. Wainwright, in responding for himself, his son, and his two lady helpers, said that no one could be more delighted to come than he was to receive and welcome them.

The 858th Meeting of the Society was held on Tuesday, October 4th, 1910, at 6-30 p.m.

An inspection of the Museum and the Library occupied the Members during the first hour.

At 7-45 p.m., Mr. F. Zimmern, F.R.G.S., took the chair, and on his proposition the Minutes of the Meetings held on April 5th, June 3rd, June 18th, and July 16th were taken as read.

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* The Meetings are held in the Geographical Hall, unless otherwise stated.

It was reported that letters of condolence had been sent, by direction of the Council, to the relatives of the following deceased Members:—

The Rev. S. A. Steinthal, F.R.G.S.; Professor T. H. Core, M.A.; Messrs. R. Hope Brown, A. Goodwin, C. V. Meyer, R. N. Michaelis, and J. D. Milne, J.P.

It was also reported that the Hon. Secretary, Mr. J. Howard Reed, F.R.G.S., prepared the following Notice, which was affixed to the Journal issued shortly after the death of the late Chairman of the Council:—

> "*Notice to Members and Corresponding Societies.*
>
> It is with profound regret that the Council have to announce the death of the Rev. S. A. Steinthal, F.R.G.S., for many years a Vice-President of the Manchester Geographical Society, Chairman of the Council for about twenty years, and one of its original members. His decease took place on May 6th, 1910, after a short illness, and at the advanced age of eighty-three years.
>
> Some little time back, owing to the physical infirmities of advancing years, Mr. Steinthal retired from tht office which he had adorned so long, but he continued to the end his deep interest in the Society's operations. Although confined to the house, and unable to take active part in affairs outside, he remained keenly alert mentally, and was in the habit of reading all the proofs of this Journal before each issue finally went to press. The Council were greatly indebted to him for this devoted service, and for his continued sound advice and valued counsel. He will be much missed."

It was further reported that some Members of the Council attended the funerals of the Rev. S. A. Steinthal and of Professor T. H. Core. The latter had been a Member of the Council since the foundation of the Society and, at all times, was ready to give valuable help to the Society.

The Election of the following Members was announced:—Honorary: Mr. Charles Roeder; Ordinary: Messrs. W. D. Bailey, J. T. Hodgson, T. C. Thompson, and B. A. Taylor; Associate: Mrs. Landless, Miss D. Ashworth, Miss R. Ashworth, Miss Pattie Garner, and Miss L. Willis.

Dr. Tempest Anderson, F.G.S., F.R.G.S., gave an account of his visit to "The Volcano of Matavanu in Savaii (German Samoa)" and illustrated his address with lantern views prepared from photos taken during his visit. On the proposition of the Chairman, a hearty vote of thanks was passed to Dr. Anderson for the very interesting account which he had given of his experiences and for the very fine illustrations of the results of Volcanic Action which had been shown.

The 859th Meeting of the Society was held in the Chemical Lecture Theatre, Manchester University (by kind permission), on Tuesday, October 11th, 1910, at 7-30 p.m.

In the Chair, Mr. F. Zimmern, F.R.G.S.

M. Aurel Stein, Esq., Ph.D., D.Litt., D.Sc., F.R.G.S., gave an Account of his "Geographical and Archæological Explorations in Central Asia," illustrated with panoramic and other fine lantern views (see page 113).

The Vice-Chancellor of the University moved and the Right Rev. the Bishop of Salford seconded a Resolution of thanks to Dr. Stein for the intensely interesting description, so well illustrated, which he had given of his journey. The resolution was passed unanimously. On the motion of Councillor S. W. Royse, J.P., it was resolved that the thanks of the Meeting be tendered to the Vice-Chancellor and the University Authorities for their kindness in lending the Lecture Theatre to the Society.

The 860th Meeting of the Society was held on Tuesday, October 18th, 1910, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meetings held on October 4th and 11th were taken as read.

The Chairman announced the election of Miss M. Halksworth as an Associate Member.

The Rev. Canon F. C. Smith, M.A., F.R.G.S., (of London and Sierra Leone, formerly of Uganda) delivered a Lecture on "Sierra Leone of To-day, with speculation on its future value to the Empire." (See page 169.) The address was illustrated with Lantern Views, many of which were from photographs taken by the Lecturer.

Mr. F. S. Oppenheim, M.A., proposed a Resolution, which was seconded by the Chairman, and passed unanimously, that the best thanks of those present be given to Canon Smith for his very interesting and instructive address.

The 861st Meeting of the Society was held on Tuesday, October 25th, 1910, at 7-30 p.m.

In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meeting held on October 18th were taken as read.

Mr. W. Leonard Flinn described his journey to and in Persia, the title of his lecture being "A Tour through Northern Persia." The address was illustrated with lantern views from photographs taken by the lecturer.

There were also on exhibition a dozen paintings of Persian scenery, &c., kindly lent for the evening by the artist, Mr. C. Waldo Adin, who accompanied Mr. Flinn.

On the proposition of Mr. J. Howard Hall, seconded by the Chairman, it was unanimously resolved that the thanks of the Meeting be given to Mr. Flinn for his interesting address and fine lantern views, and to Mr. Adin for the loan of his pictures.

The 862nd Meeting of the Society was held on Tuesday, November 1st, 1910, at 7-30 p.m.

In the Chair, Mr. F. S. Oppenheim, M.A.

The Minutes of the Meeting held on October 25th were taken as read.

The Chairman referred to the loss by death of Mr. B. C. Alexander, one of the Original Members, and mentioned that a letter of sympathy to his relatives had been sent by direction of the Council.

Mr. J. Howard Reed, F.R.G.S., gave an Address on "British Cotton Growing," which was illustrated with a very clear, instructive, and interesting collection of lantern views. (See page 179.)

A resolution of thanks to Mr. Reed for his address was moved by Mr. R. A. Staniforth, seconded by Mr. J. Herbert Cooke, supported by the Chairman and passed unanimously.

The 863rd Meeting of the Society was held on Tuesday, November 8th, 1910, at 7-30 p.m.

In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meeting held on November 1st were approved.

The Election of the following Members was announced: Ordinary: Miss N. Clague, Miss Eunice Swallow, Messrs. Alfred Burgess, A.C.A., J. W. Goodwin, T. H. Hibbert, Harold F. Massey, A. E. Shaw, Sidney Smith, and Albert Wilmore, D.Sc.; Associate: Miss Hilda Ingham.

Mr. Harold Edgar Young gave a Lecture entitled: "John Chinaman: being an Account of a Walk in Southern China." Synopsis: John Chinaman *versus* the Heathen Chinee—John Chinaman as I read about him, and as I found him—I engage a servant—Hong Kong—Something like a meal—Ascent of the Peak—A country walk in Hong Kong—The Kowloon Peninsula—A day among the Farmers—Water Buffaloes—The Yang-tse-Kiang—Life on a Chinese Junk—Chinese Graves—Shanghai—Life on a Sampan—Chinese Men—Chinese Women—Chinese Children—I go to the Theatre—Chinese Temples—A visit to a Joss House—Life on the road to Nanking—A day with a Chinese Gentleman—The Barrow Man—Chinese Tea Houses—Chinese Inns—An Opium Den—John Chinaman at San Francisco—Yellow Men *versus* White Men—"East or West, Home is Best." The address was illustrated with very fine original lantern views, and was a continuation of the two lectures previously delivered by Mr Young.

On the proposition of the Chairman a cordial vote of thanks was passed to the Lecturer for his very entertaining and instructive address.

The 864th Meeting of the Society was held on Tuesday, November 15th, 1910, at 7-30 p. m.

In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meeting held on November 8th were taken as read.

The Election of Miss W. Stevenson as as Associate Member was announced.

Mr. T. A. Edwards gave an Address, entitled, "My African Journey—Capetown to Beira." Mr. Edwards described his journey of about eight months, in which he covered 23,000 miles, walking 1,500 miles (fully equal to 6,000 miles at home). The address was well illustrated with a large number of lantern slides made from the lecturer's own photographs.

The Chairman moved, and it was unanimously resolved that the cordial thanks of those present be tendered to Mr. Edwards for the very interesting and realistic account which he had given of his journey.

The 865th Meeting of the Society was held on Tuesday, November 22nd, 1910, at 7-30 p.m.

In the Chair, Mr. George Ginger.

The Minutes of the Meeting held on November 15th were taken as read.

The death of Mr. James Barningham, a Member of the Council, was mentioned, and a Resolution of sympathy with his wife and family was passed. The Society was represented at the funeral by the Honorary Treasurer and the Secretary.

The Rev. James Johnston, F.R.Hist.S., gave a Lecture on "Mexico: the Land of Romance and Beauty." The address was illustrated with lantern slides.

On the motion of the Chairman a Resolution of thanks to the Lecturer was passed unanimously.

The 866th Meeting of the Society was held on Tuesday, November 29th, 1910, at 7-30 p.m.

In the Chair, Mr. E. W. Mellor, J.P., F.R.G.S.

The Minutes of the Meeting held on November 22nd were taken as read.

The Election of the following new Members was announced: Ordinary: Mrs. W. T. Bax, Messrs. R. Heaton Smith and Reginald Wright; Associate: Mrs. R. Heaton Smith.

The Chairman announced that Mr. J. Howard Reed, F.R.G.S. (the Society's Delegate to the British Association Meeting at Sheffield), had transmitted, to be read at this Meeting of the Society, the Address given by Professor A. J. Herbertson, M.A., &c., as President of the Geographical Section of the Association. On the proposition of the Chairman it was resolved to take it as read, together with Mr. Reed's Report.

Mr. H. N. Morris gave a Lecture descriptive of his journey "Through India to Burmah." The chief places which he visited during a Three Months' Business Tour were Bombay ,Madras, Rangoon, Mandalay, Calcutta, Cawnpore, Agra. The address was illustrated with many lantern views.

A resolution of thanks to Mr. Morris for the interesting account which he had given of his journey was moved by the Chairman and passed unanimously.

The 867th Meeting of the Society was held on Tuesday, December 6th, 1910, at 7-30 p.m.

Mr. F. Zimmern, F.R.G.S., in the Chair.

The Minutes of the Meeting held on November 29th were approved.

A Lecture was delivered by Madame G. M. Vassal on the "Philippine Islands"; describing a visit by the lecturer and Dr. Vassal, her husband. The lantern illustrations shown were prepared from photographs taken by Dr. and Mrs. Vassal.

On the motion of the Chairman a very cordial vote of thanks to Mrs. Vassal for her interesting and instructive address was passed unanimously.

The 868th Meeting of the Society was held on Tuesday, December 13th, 1910, at 7-30 p.m.

Mr. F. Zimmern, F.R.G.S., presided.

The Minutes of the Meeting held on December 6th were taken as read.

The Election of Mr. W. Leonard Flinn as an Ordinary Member was announced.

Alderman Sir Bosdin T. Leech, J.P., gave a Lecture on "The Panama Canal," being impressions of a visit to the Canal in the Spring. The address was illustrated with a fine set of lantern slides never shown before in England.

On the motion of the Chairman a unanimous vote of thanks was passed to the lecturer for the very interesting and instructive account which he had given of the Canal.

The 869th Meeting of the Society was held on Tuesday, December 20th, 1910, at 7-0 p.m., and took the form of a Lecture to the children of the Members.

Mr. T. W. Sowerbutts, F.S.A.A., presided.

Mr. William Robinow gave an Address, entitled, "Scenes in the East," being a description of a journey taken by his sister and himself to Ceylon, India, Burma, Malay Peninsula, China, and Japan. The address was illustrated with a large number of beautiful coloured and other slides prepared from photographs taken by Mr. Robinow during the journey.

On the suggestion of the Chairman the children applauded heartily in acknowledgment of the very interesting and entertaining account which Mr. Robinow had given of his journey.

List of Maps, Books, Journals, etc.,

ACQUIRED BY THE SOCIETY FROM JANUARY 1st TO DECEMBER 31st, 1910.

MAPS.

GENERAL.

Map of the World: 1/1,000,000. Resolutions and Proceedings of the International Map Committee; assembled in London, November, 1909. With Diagrams, Plate, and Tables. London: 1910. *The Director of Military Operations, Geographical Section, General Staff, War Office.

Tables for the Projection of Graticules for Maps on the Scale of 1/1,000,000. Prepared by the Geographical Section of the General Staff. London: War Office, 1910. *The Director of Military Operations.

Globuskarte, Weltkarte in Teilkarten in einheitlichem Flächenmassstabe, mit einer Statistischen Tabelle der selbständigen Staaten und der deutschen Kolönien von Sipman. Massstab 1/74,000,000. Berlin: Dietrich Reimer (Ernst Vohsen), 1907. *Mr. Egbert Steinthal.

EUROPE.

Cycling Map of the British Isles, with parts of France, Belgium and Holland. Scale 24 miles to 1 inch. London: Mason and Payne. *Rev. S. A. Steinthal, F.R.G.S.

Commercial and Political Map of the British Isles. Planned and Compiled by Alexander Gross. London: Geographia Designing and Publishing Co. Ltd., 1910.

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List of Members,

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Rules.

I. OBJECT AND WORK.

The object of the Manchester Geographical Society is to promote the study of all branches of Geographical Science, especially in its relations to commerce and civilisation.

The work of the Society shall be :—

1. To further in every way the pursuit of the science; as, by the study of official and scientific documents, by communications with learned, industrial and commercial societies, by correspondence with consuls, men of science, explorers, missionaries, and travellers, and by the encouragement of the teaching of geography in schools and colleges.

2. To hold meetings at which papers shall be read, or lectures delivered by members or others.

3. To examine the possibility of opening new markets to commerce and to collect information as to the number, character, needs, natural products and resources of such populations as have not yet been brought into relation with British commerce and industry.

4. To promote and encourage, in such way as may be found expedient, either alone or in conjunction with other Societies, the exploration of the less known regions of the earth.

5. To inquire into all questions relating to British and Foreign colonisation and emigration.

6. To publish a Journal of the proceedings of the Society, with a summary of geographical information.

7. To form a collection of maps, charts, geographical works of reference, and specimens of raw materials and commercial products.

8. The Society shall not enter into any financial transactions beyond those necessarily attached to its declared object, and shall not make any dividend, gift, division, or bonus in money unto or between any of its members.

II. ORGANISATION.

9. The Society shall consist of ordinary, associate, corresponding, and honorary members.

10. A Council shall be chosen annually from the ordinary members to conduct the affairs of the Society. It shall consist of a President, four or more Vice-Presidents, a Treasurer, two or more Honorary Secretaries (including a Secretary for Foreign Correspondence), and twenty-one Councillors.

11. There shall be three Trustees elected by the Society, who shall hold office until death, disability, insolvency, or resignation. They shall be members of the Council by virtue of their office.

12. Any vacancy occurring in the Council during the current year may be filled up by the Council.

III. ELECTION OF MEMBERS.

13. Every candidate for admission into the Society as an ordinary or an associate member must be proposed by a member. The proposal shall be read out at the next Ordinary Meeting of the members, and any objection shall be forwarded in writing to the Secretary within seven days.

14. The election of members is entrusted to the Council. The names of those elected shall be announced from the chair at the next Ordinary Meeting after the election.

15. The Secretary shall within three days forward to every newly-elected

member notice of his election, a copy of the Rules of the Society, and a card announcing the days on which the Ordinary Meetings will be held during the session. But the election of an ordinary or associate member shall not be complete, nor shall he be permitted to enjoy the privileges of a member, until he shall have paid his first year's subscription. Unless such payment be made within three calendar months from the date of election the election shall be void.

16. The Council shall have power to elect honorary and corresponding members.

17. Women shall be eligible as members and officers of the Society.

IV. PAYMENTS.

18. An ordinary member shall pay an annual subscription of £1. 1s., or he may compound by one payment of £10. 10s. An associate member shall pay an annual subscription of 10s. 6d. The Society's year shall begin on the first day of January.

19. Members shall not be entitled to vote or to enjoy any other privilege of the Society so long as their payment shall continue in arrear, but associate members shall not vote nor shall they take any part in the government of the Society.

20. The first annual payment of a member elected in November or December shall cover his subscription to the 31st December in the year following.

21. On the first day of January in each year there shall be put up in the rooms of the Society a complete list of the members with the amount of their subscription due, and as the amounts are paid the fact shall be marked on the list.

22. Notice shall be sent to every member whose subscription shall not have been paid by the first of February, and if the arrears are not discharged by the first of July the Council may remove the member from the list of members. Any member, whose subscription is in arrear for two years shall not be entitled to receive the Journal of the Society.

V. MEETINGS.

23. The meetings of the Society shall be of three kinds—Ordinary, Annual, and Special.

24. In all meetings a majority of those present shall decide all questions, the President or Chairman having a casting vote in addition to his own.

Ordinary Meetings.

25. The Ordinary Meetings of the Society shall be held once a month, from the month of October to the month of May, or oftener, if judged expedient by the Council.

26. All members whose subscriptions are not in arrear shall have a right to be present. All ordinary members shall have the privilege of introducing one visitor.

27. The order of the proceedings shall be as follows:—

(a) The minutes of the last meeting to be read and if correctly recorded they shall be signed by the Chairman.

(b) Presents, whether of money, books, maps, charts, instruments or specimens made to the Society to be announced.

(c) The election of new members to be declared and the names of candidates to be read.

(d) Papers and communications to be read and discussed.

28. At these meetings nothing relating to the rules or management shall be

brought forward, but the minute book of the Council shall be on the table at each meeting for the inspection of any member, and extracts therefrom may, with the consent of the chairman, be read to the meeting on the requisition of any member.

29. On occasions of exceptional interest the Council may make provision for a larger admission of visitors.

Annual Meetings.

30. The Annual Meeting of the members shall be held at such time and place as the Council may determine.

31. Fourteen days' notice of such meeting shall be sent to every member within the United Kingdom who has given his address to the Secretary, and notice of the meeting shall be advertised in such newspapers as the Council may direct.

32. The object of this meeting shall be to receive the Annual Report of the Council and the Treasurer's Balance Sheet, to hear the President's address, to elect the Council and officers for the ensuing year, and to transact any other business.

33. Any two ordinary members may nominate candidates for the Council or for office not later than one week prior to the day of election, and the names of candidates so nominated shall be at once put up in the rooms of the Society. The election of the Council and officers shall be by ballot.

Special General Meetings.

34. The Council may call a Special General Meeting of the Society whenever they shall consider it necessary, and they shall do so if required by 20 ordinary members.

35. A week's notice of the time and object of every Special Meeting shall be sent to all members. No other business shall be entertained than that of which notice has been thus given.

36. Twenty ordinary members shall form a quorum.

VI. COUNCIL AND OFFICERS.

The Council.

37. The government of the Society shall be entrusted to the Council, subject to the rules of the Society.

38. The Council shall annually elect a Chairman and Vice-Chairman.

39. The President or the Chairman, or any three members of the Council, may at any time call a meeting thereof, to which every member of the Council shall be summoned.

40. Seven shall form a quorum.

41. In order to secure the most efficient study and treatment of the various subjects which constitute the chief work of the Society, the Council may appoint Committees for special purposes. These Committees, with the approbation of the Council, may associate with themselves any persons—whether members of the Society or not—from whom they may desire to obtain special assistance or information. The Committees shall report to the Council the results of their proceedings.

42. The President, Chairman, Vice-Chairman of the Council, and the Honorary Secretaries, shall, by virtue of their offices, be members of all Committees appointed by the Council.

President and Vice-Presidents.

43. The President is, by virtue of his office, the chairman of all the meetings of the Society. In the absence of the President, one of the Vice-Presidents may preside.

Chairman of the Council.

44. It is the duty of the Chairman of the Council to see that the rules are properly observed, to call for reports and accounts from Committees and Officers, and to summon, when necessary, special meetings of the Council and of Committees.

Treasurer.

45. The Treasurer has the charge of all accounts; he shall pay all accounts due by the Society after they have been examined and approved by the Council.

46. He shall see that all moneys due to the Society are collected, and shall have power, with the approval of the Council, to appoint a collector. All moneys received shall be immediately paid to the bankers of the Society.

47. The bank passbook and the book of accounts shall be laid upon the table at every ordinary meeting of the Council.

48. The accounts shall be audited annually by two members, who shall be elected at an ordinary meeting at least one month before the Annual Meeting.

Secretaries.

49. The duty of the Honorary Secretaries shall be :—

(a) To conduct the correspondence of the Society and of the Council.

(b) To attend the meetings of the members and of the Council, and minute their proceedings.

(c) At the ordinary meetings, to announce gifts presented to the Society since their last meeting; to read the names of all new members and of candidates for admission, and the papers communicated to the Society, which have been directed by the Council to be read.

(d) To have immediate superintendence of all persons employed, to make arrangements for the meetings of the Society, and to take charge of all maps, books, furniture and other effects.

50. It shall be the more especial duty of one of the Honorary Secretaries to conduct, as may be directed by the Council, correspondence with Foreign Societies, and with persons resident abroad.

51. In addition to the Honorary Secretaries, there shall be a paid Secretary appointed by the Council, whose duties shall be to assist the Honorary Secretaries, to issue the notices of the Council and of the Society, and to act under the instructions of the Council.

The foregoing Rules, as now amended, were approved and adopted at a meeting of the members of the Society, of which due notice had been given to the members, held in the Town Hall, Manchester, Wednesday, October 3rd, 1894. (Signed) GEORGE, President.

S. ALFRED STEINTHAL, Chairman.
F. ZIMMERN, Honorary Secretary.
JAS. D. WILDE, M.A., Honorary Secretary.
ELI SOWERBUTTS, Secretary.

[Copy.]

It is hereby certified that this Society is entitled to the benefit of the Act 6 and 7 Vict., Cap. 36, intituled "An Act to exempt from County, Borough, Parochial, and other Local Rates, Lands and Buildings occupied by Scientific or Literary Societies."

Seal of Registry of
Friendly Societies.

This 15th day of January, 1895.

E. W. B.

THE

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1911

The
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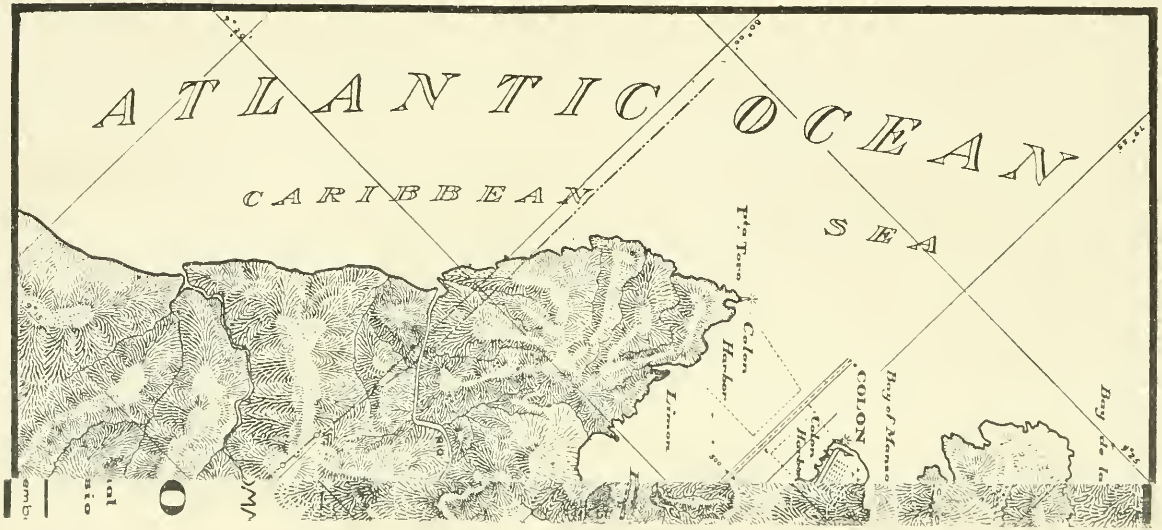ATLANTIC OCEAN
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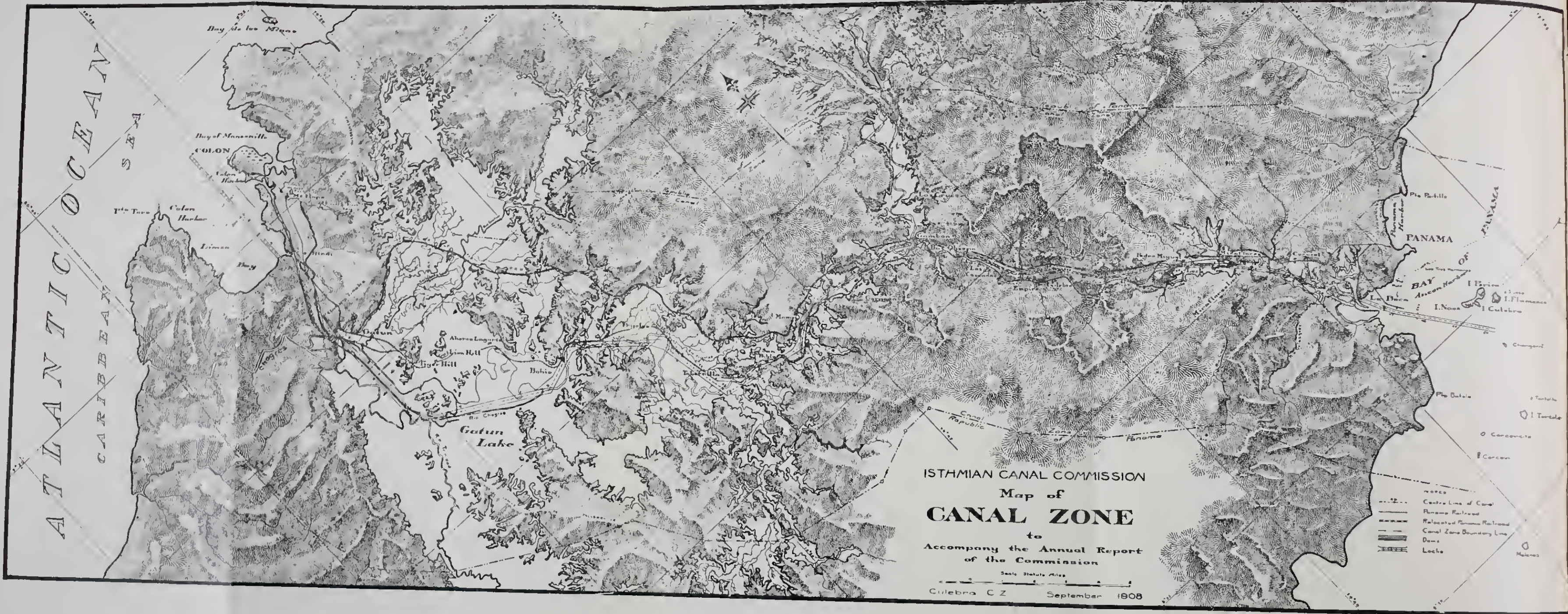


ISTHMIAN CANAL COMMISSION

Map of

CANAL ZONE

to

Accompany the Annual Report of the Commission

Culebra C Z September 1908

The Journal

OF THE

Manchester Geographical Society.

* * *

THE PANAMA CANAL.

By ALDERMAN SIR BOSDIN T. LEECH, J.P.

(Addressed to the Society in the Geographical Hall on Tuesday, December 13th, 1910.)

THE eyes of the world have been drawn, for nearly thirty years, to this great work, which has passed through vicissitudes of no ordinary character. The question is asked on all sides, "Will it ever be completed? and, if made, will the advantages derived be commensurate with the vast expenditure of life and money which must be incurred?"

I have made a point of inspecting the chief ship canals that have been constructed, and when, last February, a party consisting of Alderman Plummer, Councillor Harrop, Mr. C. H. Scott and myself (the three latter Ship Canal directors) decided to visit the West Indies, we arranged to make the Panama Canal part of our programme.

Colon was reached in the ss. "Tagus" on the 13th of March, and on our arrival we were waited upon by Col. Goethals, Chairman and Chief Engineer of the American Isthmian Canal Commission, a most courteous gentleman, who said he had had several letters about our coming (one being from the War Office at Washington), with instructions to pay us special attention. Certainly no one could have been more kind and helpful than was Colonel Goethals. On the first day he took us in his private railway carriage the whole way to Panama, nearly fifty miles. We stopped at all the principal points on the works, and listened to his personal explanations; and he then entertained us to lunch at his own house at Culebra. He had engaged rooms for us at the "Tivoli Hotel," Panama, a fine and commodious house built by the Government. Next day we left by the 6-30 train to re-join him and his assistant, Colonel Hodges, at Culebra. Our hosts again gave us every opportunity of critically examining the Culebra cutting, the construction of the various locks and dams, and the remainder of the works. When we had seen everything Colonel Goethals franked us, by railway, to Colon, where we re-joined our steamer. No one could have seen the Panama Canal under better auspices, and we owe a deep debt of gratitude to our conductors for their kindness and attention.

History of the Canal.

The intrepid Balboa, in 1513, was the first man to scale the Culebra Mountains and get a view of the Pacific, and ever since then there have been visions of constructing a waterway to connect the Atlantic and Pacific Oceans. So far back as 1520 the King of Spain had a survey made for that purpose, but nothing was done. A railway across the Isthmus was made in 1855, at a cost of £1,650,000, by an American syndicate, who handsomely repaid themselves by making passengers pay 25 dollars (or £5. 4s. 2d.) for the fifty miles travel; they carried their monopoly so far that a man who walked had to pay 10 dollars (over £2) for even passing over the line. This was reduced, but even now the 3rd class fare is 5 cents a mile, and goods pay 1 dollar to 3½ dollars per ton, according to classification.

In 1866 the United States Government recommended a Commission of Enquiry, and in 1869 President Grant had one formed, which reported in 1876 in favour of a Nicaraguan Canal; the matter, however, dropped. Flushed by the success of the Suez Canal, De Lesseps, in 1879, held a Congress of Engineers at Paris, and in 1881 formed an Inter-Oceanic Company for constructing a canal by the Panama route, expecting the already constructed railway would be of service to him. In November, 1883, De Lesseps visited Manchester, and I had a long talk with him about his Panama project, about which he was very sanguine. Every one knows under what good auspices he started the work, but De Lesseps was not a practical engineer, and the physical difficulties he had to encounter and the frightful loss of life that occurred, together with scarcity of funds, brought his adventure to grief. There can be no doubt that De Lesseps did good work: in eight years he spent £12,000,000. The whole concern came into liquidation in 1889, and was taken over by the new Panama Company, who struggled with it for a further twelve years, till, in turn, their working funds were exhausted.

All the time the United States had been watching the course of events. She proposed to make a canal by the Nicaraguan route and adopt the lock system, which, it was said, would save time and money. This alarmed the French company, and they sought a conference and tried to come to terms and sell their concern. President McKinley took the advice of a Commission of Engineers, who advised a high level canal and preferred the Panama to the Nicaraguan route. They recommended the purchase of the partly-constructed works if they could be bought for £8,000,000, but scouted the much higher price that had been asked for them. Eventually America bought the works and also the railway for £8,000,000. When the Americans took possession, in 1904, the French excavations had paved the way for either a high or low level canal; no unnecessary labour had been done, except some extra excavation in the Gatun Valley. In case of a sea level canal the Chagres River would have had a lock at Bohio. For a high level canal the dam must be placed at Gatun. Then came negotiations with the Republic of Colombia, who had sovereign rights over the soil, and with whom De Lesseps had treated for the privilege of crossing. Also with Great Britain, who, in 1850, had come to terms with U.S.A. for a joint protectorate of any passage across the Isthmus. The rights of Great Britain were waived by the Hay-Paunceforte Treaty of 1901. The United States offered Colombia £2,000,000 down and £20,000 per annum after nine years for a strip of land ten miles broad, on which to make the Canal. To the surprise of everybody, Colombia, after holding out hopes of acceptance, rejected this offer. Panama, as one of the Colombian provinces, had been in favour of the Canal, and had not been on good terms with the Mother Republic. She immediately declared herself independent, and was recognised by the United States as the Republic of Panama. A fortnight after, a treaty was made between Panama and the United States, whereby the former ceded a belt ten miles wide for the Canal, and agreed to take £2,000,000 for the ownership and control of it, with an annual payment after nine years of £50,000. The Isthmian Commission govern the canal zone on American lines, receiving £2,000 per year from the American Government towards sanitary expenditure in the city of Panama, the Panama Republic paying half the annual cost of Colon sanitation. The towns of Colon and Panama, though within the ten mile limit, did not pass to America, but the United

States virtually govern them, and entirely so in regard to sanitary matters. She has also undertaken the water supply both to Panama and Colon. Cristobel, adjoining Colon, belongs to the United States, and here are the chief works.

The pressure brought to bear on the Colombian Republic by the U.S.A. for purposes of her own has been a subject of much comment. Colombia was powerless; she had no army fit to cope with the American forces, and, though furious, she was compelled to submit and relinquish Panama.

By the Panama Treaty the Canal in time of peace is to be free and open to all nations on terms of equality as to use and charges, but the United States have the sole right to erect fortifications to protect her interests on the Canal.

Having secured the necessary rights, President Roosevelt, in 1905, called together a board of eight American and five European consulting engineers—one of whom was Mr. W. H. Hunter of the Manchester Ship Canal—to decide if the French idea of a sea level canal should be proceeded with, or if a cheaper and more expeditious high level canal with locks should be constructed. The majority, consisting of five foreign and three American engineers, recommended a sea level canal, whilst five American engineers favoured a lock canal. Nevertheless, the American Government decided on the latter. Before finally doing so they had called together an Isthmian or Local Committee of Engineers, who, by a majority of six to one, recommended a lock canal. Further, the Senate appointed an Inter-Oceanic Canal Committee, who reported in favour (by a majority) of a sea level canal, but their report was upset when the matter came to be debated in the open Senate. Finally, the Government adopted the minority report, which was ratified in the House of Representatives, and decided to place the carrying out of the works in the hands of their Army Engineering Department.

Geography and Description.

A mistaken idea prevails, viz., that the Canal runs from east to west to connect the Atlantic and Pacific. Owing to the swan-neck band of the Isthmus it actually runs direct north and south—Colon being north of Panama. As the crow flies the Isthmus at Panama is 36 miles across; the bends in the channel and the estuarial work, added to this, make the total length 50 miles. From the crest of the Culebra Range to the Pacific Coast is six miles.

On the Atlantic side a channel is dredged for 4½ miles through Limon Bay to the mainland. The entrance from the ocean will be protected by breakwaters. The old French channel ran inland, and did not pass through the estuary. From the coast to the Gatun Locks is about 3½ miles. At Gatun, three locks and a dam raise the Canal 85 feet, and help to form a lake of 168 square miles, into which the river Chagres will deliver itself, and through which a canal channel will run for about 23½ miles, practically to Gamboa. Between this place and Gatun the Chagres river crosses the line of the Canal 23 times. Soon after leaving Gamboa the mountainous district of Culebra is encountered, which runs almost to Pedro-Miguel, the site of single locks and also a dam. Below this lock runs the Rio Grande, and this river is impounded and formed into a lake by a dam and a double set of locks at Miraflores. The Canal is conducted in a trained channel through the lake. Outside the mainland a dredged channel is carried for 4½ miles close to the island of Naos, and to protect it a breakwater is being formed with the material excavated from Culebra, which is being dumped into the sea by means of a trestle bridge. The changes that will be wrought by the Canal can only be realised on the spot; it is difficult from a map to get a true conception of the work being done. In this tropical country vegetation grows so fast that in a few weeks it is scarcely possible to trace even where deep cuttings have been made. Where we walked on dry land in the Gatun Basin, will, in time, have 45 feet of water over it, more or less burying all the hills.

In a few places the Canal is completed, and the river Chagres turned into its new course; this is the case between Matachin and Gorgona. At the Pacific end there is also a complete length of five miles.

One of the most interesting places on the Canal is Gorgona. There are many minor workshops, but here is centred the great workshop of the Isthmus. It is filled with the best labour-saving machinery, and stands on 21 acres of land. In it are seven miles of railway track. Oil is the fuel used. The various workshops make their own electricity, and at the one at Empire is an installation of 8,857 lights. On the whole there is a production of 3,703,407 kilowatts, at a cost of two-thirds of a penny.

As a supply of water sufficient for a Canal and its locks is necessary for success, the Commission have taken steps to ascertain all particulars as to rainfall and evaporation. To test the latter they have had exposed tanks, which show that the greatest evaporation occurs in February, March and April, and the least in October and November. The rainfall gauges show the least fall to be in February and March, and the greatest in October, November, and December. In December, 1906, 10·48 inches fell at Gatun in one day, and in November, 1909, at Gamboa 28·41 inches of rain fell during the month.

The Canal has a minimum depth of 40 feet and the normal water level is 85 feet above the sea level. It has a minimum bottom width of 300 ft. when passing through the Culebra cutting, and widens out to 1,000 ft. Near this cutting the speed of ships will be limited to 4½ miles per hour. It is anticipated that it will take ten hours for a ship to pass through the Canal. The highest point at Culebra that has had to be cut through is 210 feet above sea level. On the Pacific the range of tide is 20 ft.; on the Atlantic side there is very little rise or fall.

The Management of the Works.

What strikes one at first is the difference between the European and American systems of carrying out large public works. In England we have engineers for electricity, waterworks, gas, hydraulics, sanitation, etc., whilst in America military engineers conduct public works, and are expected to be all-round men, capable of turning their hands to all kinds of engineering.

It follows that the works are carried out under a military system and with military precision—a soldier being at the head of most of the departments. Colonel Goethals is the pivot round which everybody works. Colonel Hodges, his second in command, takes charge of locks, dams, and all civil engineering. Then come the Atlantic, central, Pacific, mechanical and sanitary divisions, each with a head and a subordinate staff. Following are the quartermasters, the subsistence, the cost, and the hydrographic departments. At the end of the year each official gives a report, accompanied by plans, to Colonel Goethals, and these form the bases of a huge report; this is annually submitted to the American Government, and I have had the advantage of perusing and making extracts from it.

The working staff on the canal works in April, 1909, numbered 33,699; and in addition to these there was a railway

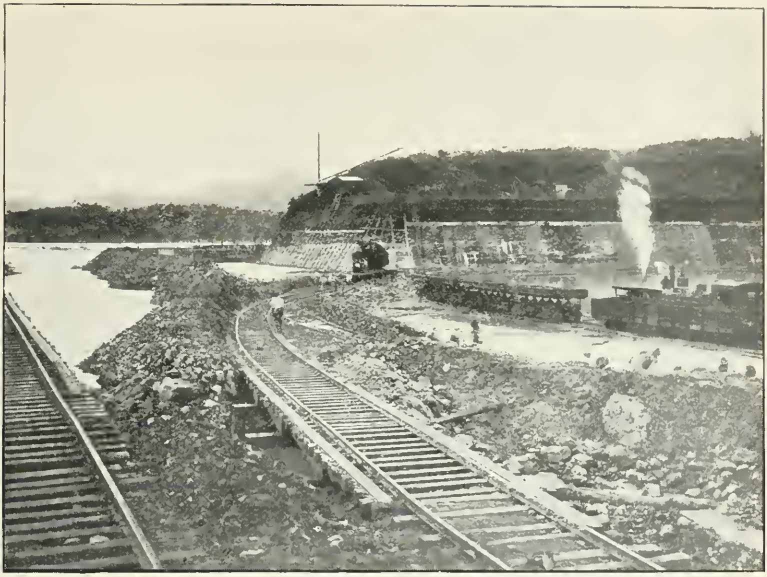


Fig. 2. Panama Canal. Gatun Spillway. Approach channel showing construction of concrete cover on Rock Slope, 1910.

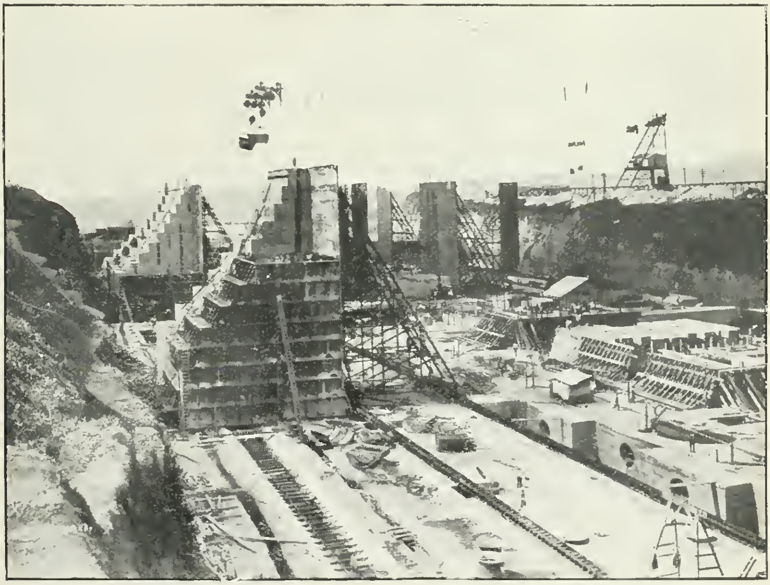


Fig. 3. Panama Canal. Upper Gatun Lock, looking South from East Wall, 1910.

staff of 7,648 men, who were engaged in laying the new line, and a further 5,000 engaged in miscellaneous work, and running the old one. At the commencement, practically no American labour was forthcoming. The largest body of labourers come from Barbadoes and other West Indian islands; next in number are the Spaniards and the Italians. They are divided into two classes—the silver roll and the gold roll; the former are mostly coloured men and labourers; the latter are white men and chiefly artizans; the silver roll men earn 5d. per hour—on an average 25/- per week; whilst the gold men earn from £4 to £10 per week. A joiner whom I questioned said he got 7 dollars a day, or £7. 11s. per week, and a superintendent on the railway was earning over £600 a year.

At one time white men could not be induced to face the terrible epidemics that existed, but since the sanitation has been rectified Americans are tempted by the wages, and now no foreigners can get berths on the gold roll.

In addition to good wages, the Commission holds out other inducements to their employees; they supply them with houses, light, fuel and distilled water without charge, and they provide daily food for 7,700 men, in kitchens, where Europeans can get good meals for 15 cents. We were also given to understand that the negroes can get a fair meal for 10 cents. They provide ample school accommodation, viz., 12 schools for white and 17 for black children; also two higher grade schools; they have established four mutual improvement and recreation clubs, placed under the management of the Young Men's Christian Association. The influence for good of this institution has been enormous. It has found rational instruction and amusement for men in their spare time, and nothing marks this more strongly than the fact that, whilst at one time there were 175 gambling saloons, there are now only 33 on the Isthmus. To crown all, the Commission allows their employees six weeks holidays, during which time they may visit their homes, and they are paid wages during their absence.

The Mode of Carrying Out the Work.

Having decided on a lock canal, a complete reconstruction of the old French Panama Railway became necessary. The old line passed through the Gatun Valley, destined in future to be converted into a large lake, with the Canal running through it. Preparatory to the conversion, over two thousand acres of forest trees on and outside the Gatun Basin had to be cleared away.

The old line is still used during construction, but in time it will give place to an entirely new line built about two miles to the east and nearer the boundary line. The new railway will be 46·2 miles in length. In addition to the main lines, and branching from them, are scores of miles of subsidiary track lines laid in a zigzag course for the conveyance of material to the works and for removing excavated soil and rock which are placed in the waggons by powerful steam excavators. It was a novelty to see a train of 18 waggons unloaded, each of which had an open end and side, with a hinged flap to fall over the buffers; when let down a continuous pathway was made the whole length of the train. On being hauled to the tipping ground a plough was fixed to the last truck connected by a wire rope to a powerful winding apparatus at the engine end. Directly power was applied the plough, with a rotary motion, forced all the material over the truck side, and in 7½ minutes the whole train load (about 320 cubic yards) was on the tip. Then came a distributing machine worked from the truck edges, and this made the heap perfectly level. Had I not seen this expeditious work with my own eyes, I could not have believed that a machine and plough worked by a wire rope could have the power to empty a whole train. Each day an average of 5,868 waggon loads of dirt are removed, and these placed in a continuous train would cover 34 miles. A waggon is loaded in five seconds. A track-laying machine, the invention of an employee, also attracted my attention, and the clever labour-saving appliances on the canal works were a revelation to me.

At Gatun is a cement shed that holds 100,000 barrels. From here an electric railway conveys the cement, sand, and broken stone through a tunnel to eight automatic mixers that turn out two yard batches of concrete. This is then taken by an electric locomotive to four duplex cableways, 800 feet across, which span the locks, and these deliver where desired. I was told the concrete used is 9 to 1, viz., 3 sand, 6 broken stone and 1 of cement. On the three lock systems, Gatun, Pedro Miguel and Miraflores, the concrete used would build 22,242 two storey houses of eight rooms each.

At Culebra lies the chief excavation work. A mountainous range has to be cut through, the highest elevation being 312 feet above the level of the sea, and here great difficulties have been met with, owing to the sides of the mountain slipping down into the canal bed. At Cucarracha first six acres were on the move, and finally the area of the slide extended to 27 acres, and about 1,400,000 cubic yards have had to be removed. Large slides have also taken place at new and old Culebra, and many other places. At Miraflores in 1908 a slip of 200,000 cubic yards crashed into the railway cutting and stopped the work.

CONSTRUCTION WORKS.

The success of the Canal depends on the works at Gatun, Pedro Miguel and Miraflores. If the locks and dams there are capable of withstanding the immense pressure of water that will bear upon them, and if the stability of the sides of the Culebra Cutting can be assured, there can be no reasonable doubt of the Canal being completed, and working well.

But it is the Gatun locks and dam which give the chief cause for anxiety; unfortunately they have not a sound rock foundation. Prior to the mixed Commission of 1906, borings had been taken to a depth of 250 feet at the Gatun dam site, which, it was stated, showed a foundation of 200 feet of material impervious to water and incompressible. Instead of the anticipated loose sand and gravel, there was a conglomeration of sand, clay and gravel, that a pick would scarcely separate. On this point, however, engineers are not agreed, and it is admitted on all sides that the river Chagres, whose waters have to be withstood, is one of the most fitful and capricious in the world.

At Gatun the locks are in pairs, side by side; there are three sets of them, one above the other; the division wall between each pair is 60 ft. thick, and this is extended in the shape of a guide pier up and down stream, so that vessels can moor to it, and be warped or electrically towed through the locks. Each lock is 110 ft. wide and 1,000 ft. long. (The Manchester Ship Canal locks are 60 ft. wide and 600 ft. long.) There are longitudinal culverts in the side walls, worked by Stoney's valves, and these fill the locks through apertures, 6 ft. wide, in the side and bottom. The locks have a 32 ft. lift. The gates are of steel, double leaf and double sheaf, and are made to mitre. For safety there is a rolling gate at the bottom Gatun lock. The locks themselves have intermediate gates protected by chain barriers. This leaves available two locks, respectively 550 and 350 feet long. For further protection, and to cut off the flow in case of accident at the summit level of all the top locks, there is a swingbridge with a sill at the bottom into which girders can be lowered to check the rush of water in case of accident. The average height of the upper gates is 54·8 feet, and of the lower 78 feet, but they vary in size. Each leaf of the largest gate is 82 feet high and 65 feet long, and weighs 640 tons. The total weight of all the lock gates on the Canal, not including fixed parts, is 50,000 tons. If they were all piled up into one tower they would be 1¼ miles high. It is expected that a ship will pass through the three locks at Gatun in fifty minutes.

The Gatun dam is of crescent shape, situated between two ranges of hills over 2,000 yards apart, and is located close to the locks. In the centre of the dam, on the best foundation that could be found, is a concrete sluice or spillway 285 feet broad and 960 feet long. Here will be placed Stoney's sluices to deal with the overflow and surplus waters of the Chagres river. Through the east side of the dam ran the course of the old French canal, which has had to be filled up. The top of the dam will be 115 feet above sea level, and is at the base 600 feet thick. The outside casing consists of rock brought from the Culebra Cutting. A deep trench has been cut inside, and in the bottom sheet piling has been driven. The trench and the interior then had hydraulic fill poured in, to form a hearting. The filling, I was told, consisted of clay and sand obtained by hydraulic dredging and then carried by pipes to form the interior of the dam. The heavy matter desposits, and the water drains away.

On questioning Colonel Goethals about the quality of the hearting, he said it had been thoroughly tested and was perfectly watertight: on this will mainly depend the stability of the dam. On November 20th, 1908, a slip took place, and President Roosevelt was so alarmed that he sent down his successor, Mr. Taft, and a commission of engineers to inspect. They reported that the filling was watertight; they did not even think that piling was necessary, and they reduced the height of the dam by 20 feet.

Prior to the Commission there had been a newspaper war in the American papers. It was said the Gatun dam had given way, indeed was sinking out of sight, and that the estimated cost would be doubled. Even the reassuring report of the Commission was attacked. It was said they were a packed jury, several of them being pledged supporters of a lock canal, and the assurance of Colonel Goethals and his subordinate engineers that the dam could be made and maintained was seriously doubted.

At Pedro Miguel, also at Miraflores, the locks and dams are on the same principle as at Gatun. They have the advantage, however, of being on solid rock, some of which is left to form part of the division walls. The hearting of the dam walls at Pedro Miguel is of puddled clay, with a minimum thickness of 140 feet. Here are adopted the Lidgerwood cables, single and duplex; these lift the sand, stone, and cement to an elevated chamber, where it is mixed into concrete and then conveyed by aerial cable ways, and dropped on the spot where it has to be used.

The costs of the various kinds of excavation and dredging are so mixed up with those for administration and sanitation that it is difficult to give them correctly; but, so far as I can make out, the minimum cost of dredging is 6½d. per cubic yard, whilst the average cost of dry excavation runs about 2/6 per cubic yard. A comparison figure shows that, year by year, a constant reduction is being affected in the cost of the various kinds of work; in 1909 the unit cost was 21 per cent. less than in the previous year.

Sanitation.

To my mind the most wonderful work performed by the American Commission has been practically stamping out yellow fever, cholera, and all other infectious diseases in five years. Previously the loss of life had been frightful, even among the West Indian natives. The whole isthmus, from Colon to Panama, during the French occupation was a white man's grave. It reeked with filth and pollution, and was a breeding place for mosquitoes and all kinds of vermin and flies. Even this year some nervous friends of mine had visions that I should never return, and tried to persuade me not to visit the plague-infected canal zone. But they were mistaken, and I can bear testimony that the Isthmus is now as healthy, and healthier, than any other part of South America. When the Americans got possesssion they realised that life was money, and it was no use importing men to die off like rotten sheep. They created a chief sanitary officer with a "carte blanche" as regarded assistance and expenditure. Every house was inspected, cleansed, renovated and made sanitary, and the whole district was drained.

Every swamp and unnecessary ditch was filled up, and those left had a coating of oil, so that they might not become breeding places for mosquitoes, flies, etc. An oil pipe was carried through the works so that all stagnant waters might be dealt with at once. The result has been marvellous; whilst, during the French occupation, thousands died from yellow fever, not one case has been recorded on the Isthmus for the last two years.

The head of this beneficent work is W. C. Gorgas, Colonel in the Medical Department of the U.S. Army, and he deserves the highest praise for his skilful and scientific treatment of the scourge. At the start he had an army of over 3,000 men at work, and his present sanitary staff numbers 1,328; these men are always on the alert, and even cut the grass round the cantonments that it may not harbour filth. The cost of sanitation and keeping the houses in order is £4,000 per month. Whilst we were in Colon and Panama we saw fewer flies than we should see at home in hot weather, and no trace of mosquitoes. This is a marked contrast to a neighbouring Colombian town which we visited, when, in the market, all articles of food were thickly covered with flies, and putridity abounded.

The Death Rate on the Panama Works.

	1908.		1909.
Silver Roll (Blacks)	19·48	...	11·98
Gold Roll (Whites)	15·34	...	11·95
Including the towns of Colon and Panama	27·67	...	22·04

This is a death rate less than that of many of our large towns in England, and speaks volumes in showing how disease will succumb to scientific treatment.

The Advantages of the Canal.

One has only to study a map to see that the Panama Canal will revolutionise the commerce of the world by preventing the necessity for ships to round Cape Horn in passing from the Atlantic to the Pacific. Of course the United States will take off the cream; the benefit to her, both in times of peace and war, can hardly be estimated. The voyage from New York to San Francisco alone will be shortened by 8,450 miles—a saving of time of 28 days by a cargo steamer. When war was declared with Spain the U.S. warship "Oregon" was in the Pacific, and she had to sail 13,000 miles before she could reach Cuba.

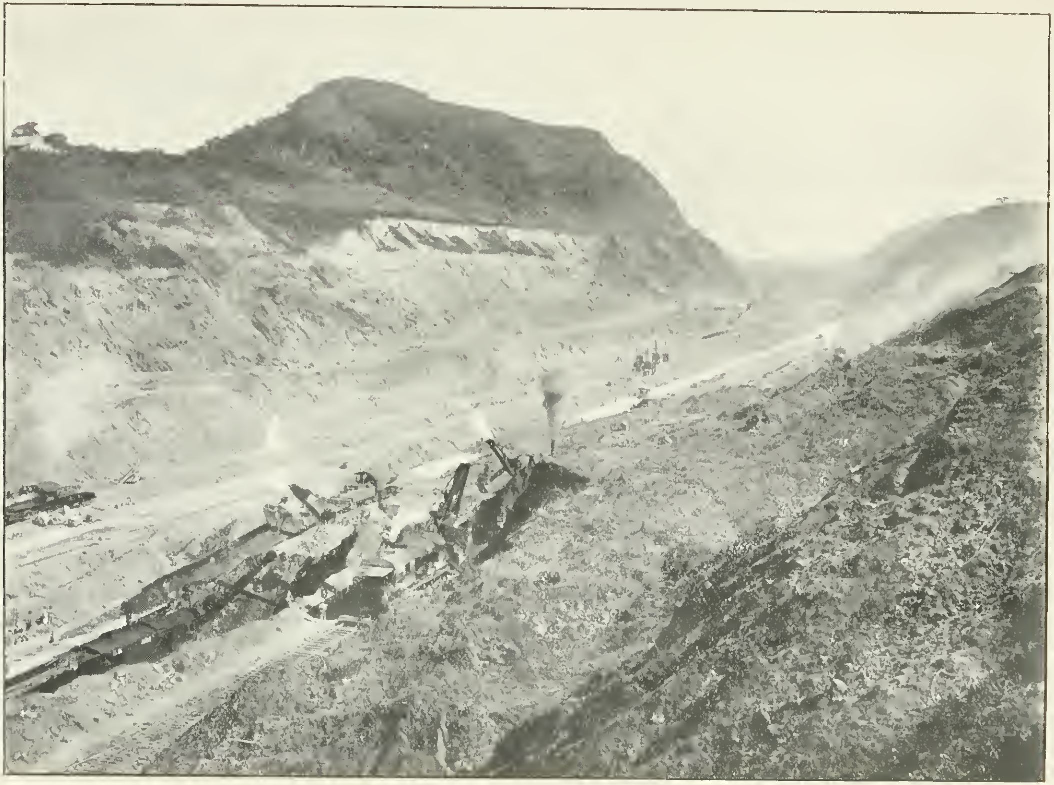


Fig 4 Panama Canal Culebra Cutting. West Bank looking South, 1909.

Had the Canal been available, she could have been on the spot many weeks earlier. England, too, will gain largely; it will bring San Francisco nearer to Liverpool by 6,000 miles; and it will shorten the distance to the average South American Pacific ports from New York by 4,709 miles, and from Liverpool by 2,600 miles.

By the new Canal Melbourne will be 2,739 miles nearer to New York than to Liverpool, and there is no question that America will become a formidable competitor with England for the trade of the world. She is the great producer of cotton which comes to Europe, and is now sent to China and India *viâ* the Suez Canal in a raw or manufactured state. Her iron and steel manufactures for the Eastern markets, too, will only have to travel half the distance, and the freight charge will be materially reduced. At present on cheap and heavy goods the freight is sometimes more than the cost of production. Few people can realise the momentous changes that will come about when the Canal is opened.

Completion and Cost.

The questions usually asked by sceptics are: "Do you think the Canal will ever be made?" "What time do you give for its completion?" and "What will it cost?" My reply to the last question is: "Nobody can tell." Every canal so far has nearly doubled the original estimate. It was so with the Kiel Canal, the Manchester Canal, and the Suez Canal. We know that up to June, 1908, America has expended £26,000,000, and the same year Colonel Goethals declined to tie himself, and said the Canal would cost 50 to 100 millions. I quite believe that if the money spent by the French and Americans was added together, and interest charged for, during construction, this Canal from its inception will have cost £150,000,000.

As regards completion, some interesting figures were attached to the official report, issued on June 30th, 1909, in which it was calculated that 34 per cent. of the work was in a finished state.

President Taft maintains it would have taken five years longer and have cost £40,000,000 more to construct a narrow sea level canal than it will to complete the present lock canal.

Colonel Goethals ventured the opinion that the locks would be completed in three years, and the remainder of the work in two years more, but as was in the case of the Manchester Ship Canal, there may yet be many slips between the cup and lip.

Both Canals had very fair sailing for the first four years. Then the Ship Canal had two years of continual flood and misfortune, which entailed heavy cost and months of delay. So on the Panama Canal, the Chagres river is a continual menace; its rise is so rapid and unexpected. On the 29th January, 1909, it rose 66·7 inches at Gamboa, filling a small cutting to the depth of 23·3 inches, and flooding the plant; and in 1879 it stood at 825 feet above sea level. One year the maximum flow varied from 4·005 feet per second in April to 24·200 in November.

To prevent loss of life, stations have been erected in the mountains so as to give eight hours' notice of probable danger.

The catastrophe at Jamaica made me feel nervous about the effect an earthquake might have on the locks and dams at Panama. I was assured, however, that the Canal was outside the earthquake zone, that constant observations were being taken at the Ancon Observatory, and that so far there had been no more tremors than at Washington or Harvard. Yet within two months of my return an awful earthquake has destroyed Cartago, a town in Costa Rica, not far from the Canal, and killed or injured 1,500 people. This shows how the unexpected may happen.

CONCLUSION.

I have been repeatedly asked: "What is your view as to the way the works are being carried out?" and, "Do you prefer a sea level or a lock canal?" I feel that, as an amateur, I am not competent to give an opinion that is either valuable or reliable, especially when I remember that the most skilled engineers have differed so widely. When De Lesseps started to saw his way through the Isthmus he had no conception of the difficulties before him,—that his men would die like rats—and that his resources would be so soon frittered away. The Americans, despite the verdict of their engineers, have adopted a lock canal, believing that it can be made more quickly and at less cost than a sea level canal. Their policy is to go full speed ahead regardless of expense; to-day their expenditure in labour is at the rate of £26 per minute. All their men are vying with each other to turn off work in quantity, and, with the danger of flood, storm and tempest, this after all may be good policy; at any rate I should not like to condemn it. President Roosevelt was certainly a bold man when he set at nought the opinions of most experienced engineers, and went in for a lock canal, and I can only hope that his judgment was sound. Under an almost military despotism as to management, with no interference from trade unions as regards piecework and the hours of labour, and with the best labour-saving machinery, the work is going on at a rate I have never seen equalled. The Gatun locks and dam, built on foundations none too good, are the crucial points of the whole Canal. The quality of the hydraulic-clay filling for the dam, and concrete for the spillway and the locks, can only have been adopted after due consideration. I trust it will turn out satisfactorily; but we in England have been used to quite another class of work. I cannot forget the slip that took place at our own Bridgewater locks, and how the walls slipped down through a vein of sand in the foundations, causing the whole lock side to move into the canal bed. Till water gets into the excavated bed I see a fertile source of danger and delay from slips, especially in the Culebra Cutting, and I feel sure the banks will yet have to be further flattened.

Since the sanitary operations scarcity of labour no longer exists. Good wages and good treatment, the American policy, is working well, and many of the coloured men are pictures of health and strength. There can be no doubt that providing good food at cheap prices pays well. The whole line, with its 27 villages, is a truck shop well administered.

A pleasing feature was the large quantity of money sent by the roll men to their relatives in all parts of the world. Considering the class of men, we found the great bulk of the labourers capable, willing and sober men, of a much better type than one could have expected.

Though at a much greater expenditure of time and money than was originally expected, there can be no doubt that the Panama Canal will be completed, and in a way that will do credit to the American Government. It will be a blessing to mariners, and certainly in time to come be ranked as one of the wonders of the world.

FIVE WEEKS IN THE ANGLO-EGYPTIAN SUDAN.

By L. Emerson Mather, F.R.G.S.

(Addressed to the Society in the Geographical Hall, on Tuesday, March 15th, 1910.)

A few weeks in such a vast territory as the Sudan gives one little right to speak with authority, and is apt to cause one to stretch one's imagination beyond the actual facts of which one is sure. I venture to think, however, that this country is very little known by the majority of Englishmen—nearly all its chief officials are, by the way, Scotchmen—except for the Dervish Revolt and the distressing catastrophe which resulted in the death of General Gordon.

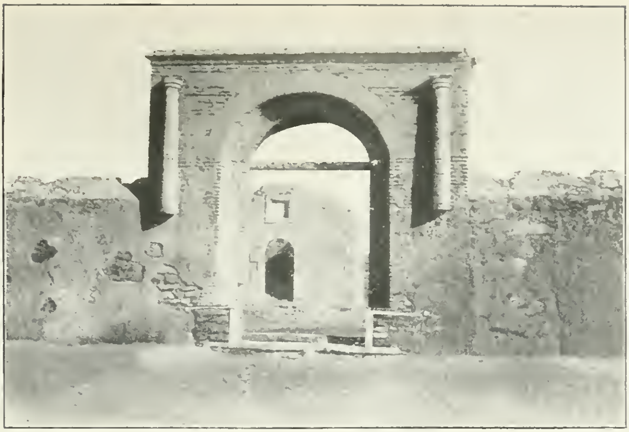
The Sudan is a country which is only just beginning to show its possibilities, and few have realized that it is anything more than an unhealthy, barren 'hinterland' to Egypt.

In order that what I intend to say may be appreciated, I will first describe its geographical position.

This territory is bounded on the north by Egypt, on the south by Uganda and the Congo, to the east lies the Red Sea and Abyssinia, while westward you have the French Congo and the little known territory Wadai. This makes up an area of nearly 1,000,000 square miles—twice as much as France and Germany together.

The great river, the Nile, on which Egypt entirely depends, is, with its tributaries, the most important feature of the country. Above Khartoum there are two rivers, the Blue and White Niles; the former rising in the mountains of Abyssinia and bringing down the great fertilizing flood water on which the whole of north-east Africa north of Khartoum depends; the latter has its source in the great lake Victoria Nyanza, and has a more constant, though less beneficial, supply. The Atbara—the only tributary to the Nile between Khartoum and the Mediterranean—also rises in the Abyssinian mountains, and contributes very largely in making Egypt a habitable country.

While speaking of the Sudan rivers I must mention the 'Sudd,' a native word implying a dam or blockage. This Sudd is a dense mass of vegetable matter growing in the upper



Anglo-Egyptian Sudan. Fig. 1. Madhi's Tomb. Omdurman.

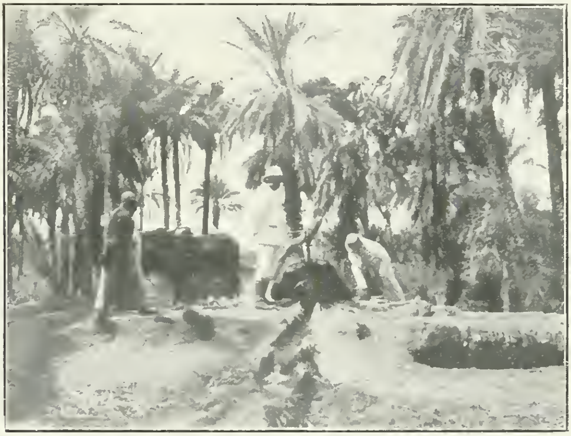


Fig. 2 Irrigation by Ox-driven Water-wheel (" Sakia ").

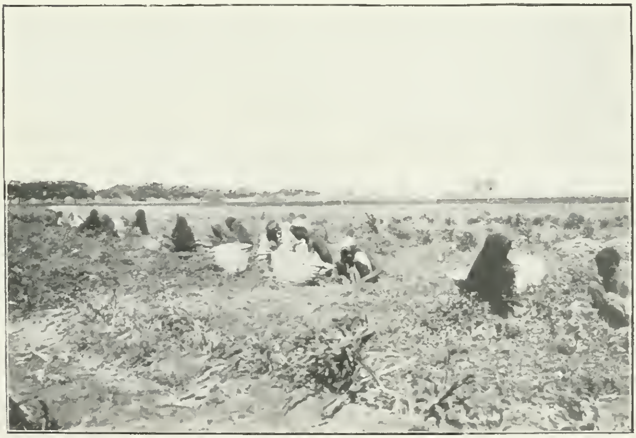


Fig. 3. Peanut-Pickers (" Ful Sudani ") on the Blue Nile.

reaches of the White Nile, which forms a continual barrier to the regular flow of the waters of the White Nile and its chief tributary the Bahr-el-Gazal. The chief vegetable growth is papyrus grass, which grows to a height of 20 feet above water and spreads at a great rate. Channels are cut every year to allow for navigation; but the weed is never destroyed, as it merely floats into a backwater and starts growing again. The surrounding country is consequently a vast swamp inhabited by the hippopotamus and the mosquito; whereas, but for the Sudd grass, this tract might be a very fertile cattle raising ground. The only word to be said in favour of this growth is that it does possibly act as a reservoir for the northern country and gives a fairly constant supply all the year round, without which the lower Nile might become almost waterless in the dry season. Between Khartoum and Assuan there are no less than six cataracts or rapids, the longest of which being 120 miles in length. Thus the Nile below Khartoum is of no value to the Sudan as a navigable waterway.

The population of the Sudan is little over two millions at the present time, though before the Dervish revolt, in 1883, it was estimated at eight and a half millions. The word 'Sudan' means the 'Country of the Blacks,' but its population is by no means all of the negroid type; around Khartoum and to the north Arabs are alone met with, the Sudanese proper inhabiting the more fertile and unhealthy country nearer the Equator. The Sudanese live entirely by cattle raising and agriculture, and do no more work than is necessary for their livelihood; but to this subject I will return later.

The historical interest of the country practically dates from the Mahdi. In this respect the Sudan is the opposite of Egypt. There are no known remains of civilization of the time when Egypt was under the sway of the Pharaohs—with one exception. Excavations are now proceeding at Meroe on the Nile, north of Atbara, which are likely to be of great importance to the archæologist, and may prove that the Sudan had a civilization as old as that of Egypt. Everyone knows the history of the Dervish revolt which led to the fall of Khartoum and the death of Gordon in January, 1885; upon which followed thirteen chaotic years of Dervish misrule, in which the population was reduced by over six millions. It was not till September, 1898, that the final blow was struck at Omdurman, which ended this tragic epoch and made way for the creation of a new Sudan under more hopeful conditions and a just and enlightened rule. Since that time the country has never looked back, though it will take many years before the population is again what it was and the products can make it a self-supporting territory.

The Government is now under the joint control of Egypt and Great Britain. Egypt supplies an annual grant of £30,000, but the administration is entirely controlled by Great Britain. There is a military force of 12,000 men, but of these only a few are British regiments, the remainder being Sudanese under the command of British officers.

The country is divided into provinces, under British Governors (Mudirs), while the districts and subordinate positions are controlled by Egyptians. The education of the natives began with the founding of the Gordon College by Lord Kitchener shortly after the reconquest in 1898; the chief object being to train the Arabs and Sudanese practically in subjects which will teach them how they may help in the building up of a great future for their country. The staff of teachers are both English and Egyptian, but most of the teaching is given in Arabic. In connection with the College are a military school and workshops, the latter being run separately for boys who only require practical manual training. The chief products of this department are carpenters and smiths: and, curiously enough, the brown Arabs and Egyptians prefer to be carpenters, while the black Sudanese become smiths! These workshops are always fully employed with work, which is sold at a profit, thus making them self-supporting. The total number of students is now (1910) over 500—every year shows an increase—and of these about 170 belong to the workshops. Elementary education is spreading throughout the country, each village having its 'kuttab' under an Egyptian master.

To return to the agricultural resources, which, together with the forests, are by far the greatest assets of the Sudan, there is every reason to believe that in time the country will be self-supporting from agriculture alone. Irrigation and improved communication are the two great factors necessary to achieve this. The former means canals and reservoirs, the latter railways. For hundreds of miles south of Khartoum there is a vast plain covered with a light subsoil, which only needs a continuous supply of moisture to make it rich and productive. At present rain falls on an average two months in the year; after which the natives sow and reap a fine crop without ploughing or treating the land in any way. Given a good supply of water two or three crops could be grown during the year. The chief crop grown is "dhurra,' a kind of millet, which constitutes the staple food for both man and beast, and is also used for thatching and bedding; in fact nothing is wasted. The greatest product, however, which is to make the Sudan prosperous is cotton. Experimental areas have been planted, and prove that Egyptian seed gives even better staple cotton than in the Delta itself. The Government are fully alive to this fact, and much is being done to help the growers. The area most suitable for a beginning is that called the 'Gezira,' the land between the White and Blue Niles, south of Khartoum. It is hoped that a canal may some day be built across this tract from the Blue Nile to Khartoum. The railway is rapidly being pushed southwards from Khartoum along the Blue Nile to Sennar, the intention being to carry the track from here across the Gezira, bridging the White Nile some 250 miles from Khartoum, and so on into Kordofan, which is a region only accessible at present by camel transport.

The Sudan has an excellent seaport at Port Sudan, on the Red Sea, not far from Suakim, whither there is already a direct railway connection from beyond Khartoum.

The forests cover a very large area of the southern Sudan, and, though they are probably the most useful of the present natural products, their wealth has been but faintly realized owing to the great difficulty of transport. Practically the only means of transportation is by river, and, as I have already said, the 'Sudd' on the White Nile effectually stops much traffic from the south, while the Blue Nile is only navigable for certain months of the year. A large quantity of gum is yearly conveyed from Kordofan by camel, but the distance is so great and travelling so slow that until the railway reaches the capital, El Obeid, the full resources of this province cannot be utilized. Rubber can be successfully grown in the far south, but the Government at present hold a monopoly in this to prevent exploitation.

The industries besides agriculture are very few; a little hand weaving and dyeing, boat building and general carpentering, and leather working constitute about the whole list.

It is often said the Sudan is no white man's country, and there is much truth in the statement. The summer is intensely hot, and is made unpleasant by the humidity of the south wind which prevails from April—October. The winters in the northern Sudan are hot, but the north wind is dry and the conditions are consequently very different. Towards the Equator the humidity is very great all the year round. This makes it impossible for white people to remain continuously in the country more than two years on end, and practically no woman cares to stand one Sudan summer. Thus it follows that a married man is unsuitable for such a country; but there are great attractions for an unmarried man, and there is no reason why the Sudan should not prosper under the young and energetic, even though their places are taken by others when matrimony calls them.

The natives—both Arabs and Sudanese—are not industrious, indeed they had never found the need to be so until British rule was firmly established, but there is no reason to doubt that they will advance with the times and realize that work means prosperity. As the Governor-General says, 'the Sudanese is indolent and a pagan, but he is a born gentleman'; from such a one surely much is possible.

I have endeavoured in this short sketch to give some idea of the possibilities of a large slice of the African Continent, which, though not actually a colony, is entirely under British guidance and is likely to remain so for some time to come.

We in Lancashire desire to see our own possessions supporting us with all the raw cotton we require for our great industry, and in the Sudan we have a vast area pronounced suitable for its production granted more favourable conditions. Let us hope the future will see these hopes and expectations amply fulfilled.

A JOURNEY IN NORTHERN PERSIA.

By W. Leonard Flinn.

(Addressed to the Society in the Geographical Hall, on Tuesday, October 25th, 1910.)

There are two questions which I am invariably asked with regard to Persia, firstly: "Where is Persia?" and secondly: "How do you get there?" Now it would be quite an invidious proceeding on my part to explain to members of a geographical society the place occupied by Persia on the map, but as regards the second question, there is apparently room for a considerable divergence of opinion. Possibly some of those present may have heard the old story of the officer, who, having to proceed to Persia, asked a friend the best route. "Let me see," said his friend, "it's near India, is it not?" "Yes, it's somewhere in that direction." "Well," said the friend, "it's quite simple, take a P. & O. steamer to Bombay." "Yes, but what do I do then?" "Oh, take a camel."—This is no doubt a romantic way of proceeding and has the merit of simplicity; but to get to the capital by the quickest route, one has to proceed by train to the port of Baku on the Caspian (5½ days from London), thence by steamer to the Persian port of Enzeli and from there to drive on the Russian road over the mountains to Teheran, 220 miles. To get to Tabriz, the railway will take you via Tiflis to Djoulfa on the Persian frontier (7 to 8 days from London), whence a carriage drive of 80 miles on a road built by the Russians and graded for a railway will bring you to Tabriz. There are now even motor buses on this road, but there are as yet no railways in Persia.

I will first remind you of the general geographical characteristics of Persia. It is a desert for two-thirds of its area, and consists of a tableland averaging over 4,000 feet above the sea, bounded on three sides by chains of high mountains. The lands at the foot of the hills are fertile enough under irrigation, but much less land is under cultivation than formerly, and ruins of kanats or underground aqueducts and villages can be seen, now far out in the deserts. There are no navigable rivers in North Persia, and most of the streams in the interior are dry or nearly so in summer and autumn. In spring, of course, there is a vast quantity of water in all these streams, but those south of the mountain chain which borders the Caspian disperse in salt lakes or marshes. The people in normal times are a pacific race but when the authority of the Central Government becomes weaker than usual, the hill-tribes come down from their mountains and make practically the whole country unsafe for travelling.

My journey was through Russia to Tabriz, from there to Teheran, and on to Kum and Ispahan. Then travelling by post-carriage it was necessary to retrace the route to Kum in order to get to Sultanabad, the centre of the carpet weaving industry. From there I went on to Hamadan, the ancient Ecbatana, where Artaxerxes, the Ahasuerus of the Book of Esther, had his palace. Returning to Teheran by the post-road I then followed the Russian road down to Resht and the Caspian Sea.

The train journey through Russia for 3½ days is very dreary, especially in winter; there is no dining car, but the train stops from 20 minutes to 1½ hours at the principal stations. After many wearisome struggles, with porters and custom house officials on both sides of the River Araxes, which is the frontier, we start off by carriage to Tabriz.* The first half of the road from Tabriz to Teheran is very bad. It is hilly, very rough, dangerous even for carriages and in winter the mud is indescribable. There is little or no accommodation for travellers, even of the primitive kind usually obtainable in Persia, for long stretches of the road. We passed through the village of Turkmanchai where the peace treaty between Russia and Persia was signed in 1828, when Persia lost Erivan and Kars. The track down by the Karachemen River is impassable for carriages, and we had to drive along the river bed, fording the river no fewer than nine times; as the water washed through the carriage each time, this was not pleasant. After crossing the difficult Kavlan Kuh Pass, on which is a ruined castle, the road improves and becomes comparatively monotonous for the remainder of the way to Teheran. I was glad to arrive for I had not had my clothes off nor slept in a bed for 15 days. (See Fig. 1.)

Teheran is a comparatively modern town and has only been

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* An account of Tabriz was omitted as the lecturer had no slides of that town.

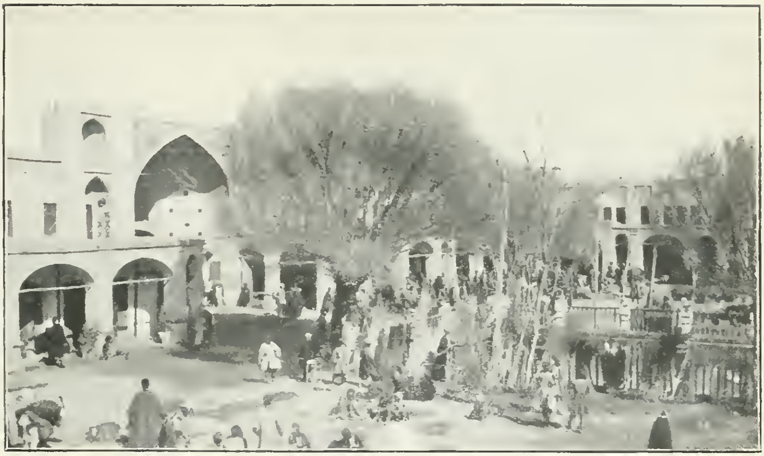


Fig. 1. Persia. Teheran, Entrance to Bazaars.

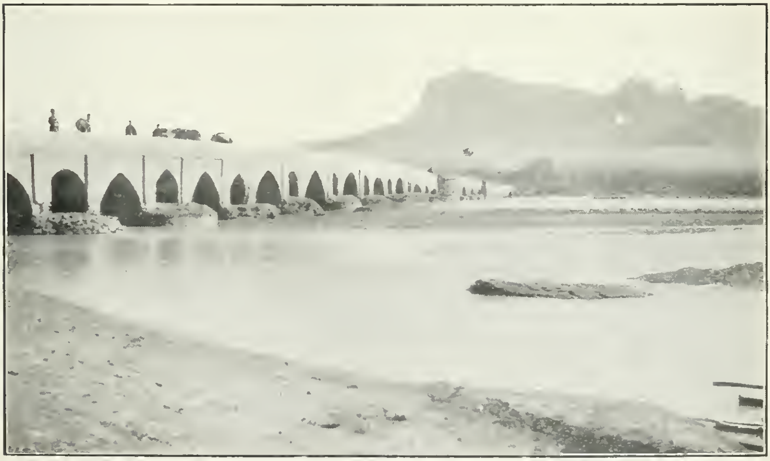


Fig. 2. Persia. Ispahan, Marnoon Bridge.

the capital for about a century. The British Legation is situated in the "Rue des Ambassadeurs." There seem to be more beggars and Dervishes in Teheran than in any other town in Persia, the latter generally carry a gourd, and sprinkle people with holy water, for which they expect a small coin or two.

A procession is held once a year in memory of the great saints of the Persian or Shiah branch of Mohammedanism, who fell at the battle of Kerbela, the victor being the Caliph Omar. Many of the men carry swords and gash their heads therewith; they wear white shifts to show the blood; and others scourge themselves with small chains.

The journey to Ispahan is singularly devoid of interest, the distance being about 300 miles. We passed a salt lake which came into sight before reaching the stage of Kushk i Nöserat, and reached Kum in 20 hours from Teheran. Here is the shrine of Fatimah, with its famous mosque with a gilt roof (said to be gold by the Persians). The next town we passed through was Kashan, where there is a fine silk weaving industry, and further on the road leads through the Natanz Mountains.

We arrived at Ispahan in about 4 days from Teheran, and the principal merchants sent presents of sweetmeats, as a welcome. The servant bringing the present had of course to be suitably rewarded, and the money given in this way exceeds considerably the cost of the present, so that receiving presents, even small ones, in Persia is an expensive habit. Truly it is more blessed to give than to receive.

Ispahan is one of the many towns that have been capitals of Persia, and it was undoubtedly the greatest of them all. During the time of Shah Abbas, who was a contemporary of Queen Elizabeth, it was in its prime. Perhaps the most remarkable of the many evidences of greatness are the bridges which cross the River Zendeh Rud on the south side of the city. The principal bridge is that of Ali Verdi Khan, a general of Shah Abbas. Lower down is a small aqueduct bridge and then the Chardju bridge leading from the Bazaar to the Mohammedan cemetery. A mile or so above the principal bridge is the Marnoon bridge. (See Fig. 2.) The water of the river is drawn off in canals for irrigation purposes and in summer there is practically no water under the bridges.

The river-bed is used for a variety of purposes, the native printers spread out their cloths here, and the Indian bodyguard from the Consulate use a sandy portion for tent pegging.

Another fine feature of Ispahan is the Meidan i Shah (Place of the King), round which are situated the Governor's Palace and the chief Mosques, and on the way to the bridge is the Madrasseh or Seminary, the interior of which is covered with beautiful blue and white tiles; this form of decoration is seen on a larger scale on the roof of one of the Mosques. On the other side of the river below the principal bridge there stood formerly a large palace known as the Haft Dast, but of this only the corner stones of a large fountain remain. The jagged mountain to be seen from Ispahan is the Kuh i Sufa where the Parsees had their burial places and a fortress, till they were driven out of the country by Shah Sultan Hussein about 1720. Shortly afterwards, however, the Afghans came, defeated and killed him, and destroyed the palace which he had built at the foot of the mountain. There was formerly a road for horses up the mountain, but only a few hundred yards of it are intact now.

The road to Sultanabad via Kum being of the usual stony and uninteresting character, we will take it as done with and drive in, as a matter of course, to Messrs. Ziegler's establishment, which is also the British Vice-Consulate. The hospitality of H.M.'s representative is such that Europeans are not allowed to remain alone in the town, there being no good accommodation for them, and as soon as he hears of an arrival, messengers are despatched and the traveller is requested to make the Consul's house his home for as long as he cares to stay.

Sultanabad is the centre of the carpet industry: if you want carpets of certain designs and colourings you have to exercise supervision over the dyeing of the wool yourself and give the weaver a pattern to weave from, for the carpet is made in the weaver's own house by his wife and children. The carpets are sent by camels to the Caspian Sea from where they are brought to England.

During my stay in Sultanabad there was much snow in winter flooding the rivers and covering the hills, in fact, the mountain near, the Sefid Khaneh, was well covered till midsummer. This mountain, being about 10,300 feet high, is well worth an ascent; the starting point is about two hours ride from Sultanabad. It is very steep and avalanches are frequent in spring. An hour's ride in the opposite direction brings you to a salt lake. Some of us constructed a boat with mast and sail complete and set out to investigate an island said to contain ruins. We found that it did not, and were almost wrecked for a furious gale sprang up whilst we were investigating its muddy expanse. (See Fig. 3.)

Before going into the less known regions it would be just as well to recall briefly the ancient history of Persia proper, as I shall mention Hamadan, the ancient Ecbatana.

Persia has had a separate existence as far as authentic historical records go for about 2,500 to 3,000 years. The Mohammedan historians, however, go back much further than that, whilst in his great epic, the Shahnameh or Book of Kings, Firdusi, the Persian Homer, gives minute records of the lives and deeds of many more or less legendary kings. Kaiomurs, according to some the grandson of Noah, is taken by these scribes as the first Persian King, but Djamsheed, to whom the Persians attribute the palaces of Persepolis, is the great king of the heroic age.

Rustem, who flourished some time after him, is the national hero to this day; and his deeds, as recounted by Firdusi, put those of Achilles or Roland quite in the shade. The chief ruins and relics of past ages, however, do not go further back than the time of the Achemenian dynasty whose best known kings were Darius, Cyrus, and Xerxes. The last named was of course the king who fought the battle of Marathon in 490 B.C. It was about this time that Zoroastrianism became the national religion of Persia. They have left behind them many traces of their glory notably the enormous ruins at Persepolis, the palace at Susa and the cuneiform inscriptions at Bisitun and Hamadan.

Then came the brief empire of Alexander and after him the Parthian kings who are best known to us by their wars against the Romans.

The Parthians were a war-like race, not much given to the arts of peace, and there is little left in Persia to show that they were ever there except their coins, which are found in large quantities. The Sassanian dynasty succeeded the Parthians about 220 A.D., and there are many sculptures, remains of roads, bridges, etc., of their time left. I have been along a valley* in the extreme west of Persia, where sometimes for hundreds of yards at a time, the track goes along a paved road

* Tang-i-Dinaver.

which dates from this time. Shapur or Sapores was the great king of this dynasty; he overcame Valerian, the Roman Emperor, and took him a prisoner to his capital which is still called Shapur. It is interesting to note that the first historical reference to Russians occurs during the history of this dynasty in 295 A.D. Chosroperves of the same dynasty took Jerusalem from the Romans. They controlled Persia for about 400 years until the Mohammedan invasion in 650 A.D.

During the next period of its history, Persia was continually falling a prey to foreign conquerors, The Tartars, the Turcomans, the Arabs, and the Moguls have all ruled over Persia, and practically the first true Persian family of rulers since the Mohammedan invasion to maintain themselves on the throne for a long period were the Sefavis, of whom Shah Abbas to whom I have already referred, was the greatest. They were overthrown by the Afghans in 1720. Shortly afterwards a Turcoman of low birth suddenly rose to power and seized the throne. He was Nadir Shah, and in the space of seven or eight years he conquered the States of Bokhara and Khiva, also Afghanistan, Beluchistan, and India. He could not prevail against the Turks and other peoples in the N.W. corner of his Empire, and was murdered after reigning 11 years. Finally about 100 years ago came the present line of kings, the Kajars, also of Turcoman origin, one of whom Nasr e Din, was here about 27 years ago, the only Shah of Persia who has ever been in Manchester.

To sum up, Persia has been during the whole of its history the prey of foreign aggression, but time after time the conquering races have been withdrawn or been overthrown, and during all these centuries the Persian character has undergone little change, to judge from the descriptions in old writings. As a rule, the Persian is a peaceful sort of person, the essence of politeness, but also cunning rather than clever and a most accomplished liar. These latter characteristics are no doubt due to centuries of oppression and bad government. Another point in which the Persians seem to differ from us is, that as a rule, the men are far more handsome than the women.

Hamadan, the ancient Ecbatana, lies 100 miles north-west of Sultanabad: a town has existed on this site for over 3,000 years. It is situated at the foot of Mount Elwend, 13,000 feet high, on the summit of which is a tomb said to be the grave of Seth.

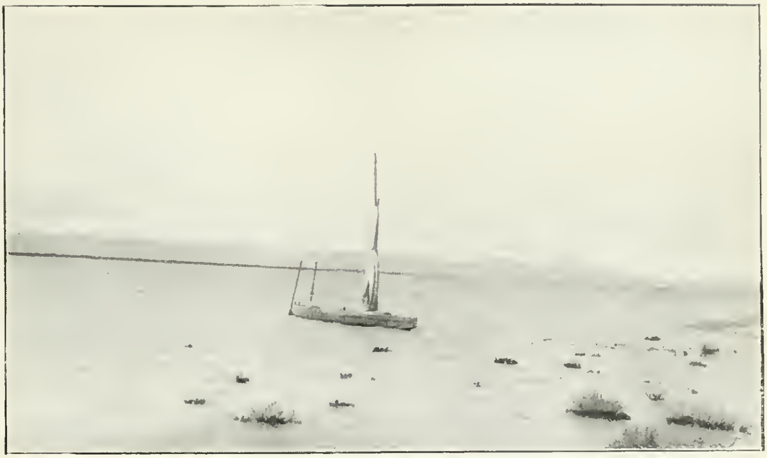


Fig. 3. Persia. Sultanabad, Salt Lake.

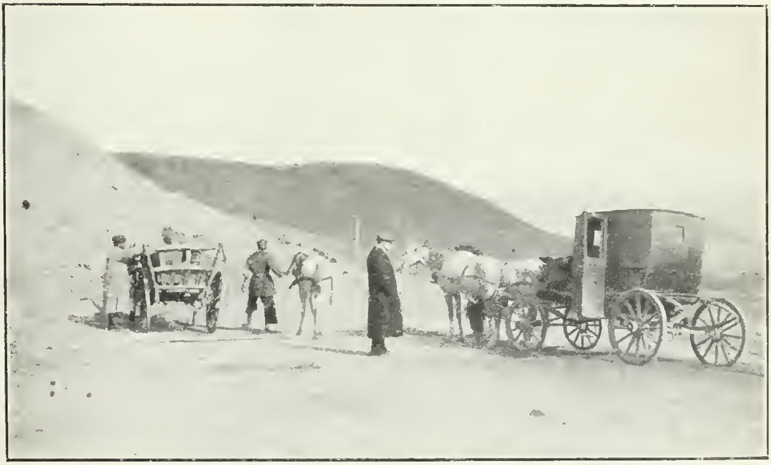


Fig. 4. Persia. Resht Teheran Road, Carriage and Luggage Cart.

The streets are very narrow and there is only one open space in the town. An interesting ruin is an old Mosque dating from the time of Henry III., called the Dumbeh Alavian. I was, so I am told, the first to take a photograph of the interior. Previous visitors committed the mistake of asking permission to do so, and this was invariably refused. I did not ask to be allowed to photograph and the crowd which quickly gathered round seemed to be quite anxious for me to get a good picture.

Just outside the town is a large mound supposed by some to have been the citadel of ancient Ecbatana, and at one end of it there is still a large stone lion, very much battered, about which nothing is known. Ecbatana having been the residence of Artaxerxes, or Ahasuerus as he is called in the Bible, there are of course the tombs of Esther and Mordecai. The building in which they are is quite modern, but the tombs are ancient, though scarcely as old as they are said to be. However there is, I think, no evidence to show that Esther and Mordecai were not buried here, so we may take it on trust.

In the valley of the Elwend Range about five miles from the town there is a cuneiform inscription of Xerxes. The inscription is in several languages and is simply an account of the glory and might of Xerxes, the great king.

We must now retrace our steps along the same road to Sultanabad, Kum, and Teheran (270 miles from Hamadan), and from there, on the homeward journey to Europe, we drive along the Russian road down to the Caspian, 220 miles away. (See Fig. 4.) The first 90 miles or so are level, but afterwards the road, after having attained a height of about 6,000 feet, descends through the mountains to the valleys bordering the Caspian. The scenery is quite different here, the mountains are green and wooded and the last 30 miles to Resht lie through a thick semi-tropical forest.

We pass several post houses (usually with toll-bars) among them Darreh Mollah Ali, Paichenar, where the old caravan road from Teheran rejoins the modern carriage road, and Sefid Kotaleh, picturesquely situated in the woods by the river. The houses in this damp forest region are quite different from those in other parts of Persia, being built of tiles and wood instead of the usual mud bricks. The road now runs for many miles between mossy banks, which, at the end of February, were covered with primroses and violets. The post-house of Resht used to be the terminus of the road, and from there the traveller had to go in a boat down a muddy creek and across the lagoon to Enzeli the port. As it is generally raining at Resht, this was usually an unpleasant journey, but now the Russians have built a good road round the lagoon.

The last time I travelled down to the Caspian, the revolutionaries (mostly Caucasians) were on their way to Teheran. I had secured a pass from one of their leaders further up country and they were very civil. They were all literally bristling with arms, some of them were swathed in cartridge belts, and carried perhaps 150 cartridges each.

Enzeli is the principal port of Persia on the Caspian, but until recently the steamers remained outside the harbour to load, because the water on the bar was so shallow. Now it has been dredged out a little, and in calm weather the steamers come in, but they do not risk it after dark. The Custom House and Offices being on opposite sides of the harbour, the long, narrow canoe-like ferryboats are in constant demand and the men get them along at a great pace, though their style would cause unfavourable comment in rowing circles over here. When the steamers cannot enter the port, the cargo is taken out to them in large lighters. On my last journey home the post-boat was anchored in the harbour, so having completed the Customs formalities we went aboard; and at sunset, turning westwards to the military civilization of Russia, we said goodbye to the Land of the Lion and Sun.

Reviews.

"The Oxford Wall Maps." Edited by Professor A. J. Herbertson, M.A., Oxford. Drawn by B. V. Darbishire, M.A. North America, 5 sheets.

The maps of this series amply fulfil all that was expected of them and Dr. Herbertson and all his helpers are to be congratulated on the production of such an excellent piece of work. The subjects treated have been found in map form in all good atlases for some years, but the teacher now has the means of indicating the same features to his class. On the scales alone there is ample material for class exercises as well as on the projections used. The numbering of the lines of latitude and longitude is to be commended, though it is doubtful whether any advantage is gained by omitting to carry the lines across the maps. The physical features are marked in shades of brown and contour lines are drawn at frequent intervals. Perhaps the lowlands deserve some colouring in a later edition. The depths of the sea are shown in a way which makes the maps not only instructive but attractive.

The climate maps include temperature and rainfall. We are not certain that different colours are an advantage in rainfall maps. Different shades of the same colour are quite as effective, and show a more gradual transition. Change of colour seems to indicate a distinct break. The vegetation map is most complete and at the same time very attractive. The authors are particularly to be complimented on this production, and the printers must be thanked for the colour effect. The series certainly surpasses anything yet published in this country. The maps are cheap when we consider the quality and accuracy of the production. T.W.F.P.

"The Toll of the Arctic Seas." By Deltus M. Edwards. London: Chapman and Hall, Ltd.

With the renewal of Arctic exploration in 1818 commenced a literature marked, not only by the bulkiness of its tomes, but by the extraordinary amount of detail (instructions, equipment, etc.) which prefaced several of the earliest, Ross's, for example, published in 1819, devoting to that purpose no fewer than 47 quarto pages. Since that time the bibliography of this literature has by its size, and scarcely less by its quality, established for itself no inferior place in the world of books. There have been, of course, several publications recording in brief Arctic exploration, but while accurately marking the progress in mapping out these frigid regions, most, if not all, fall more or less short in placing in cameo the men whose heroism in combating such overwhelming odds, and whose sacrifices, have so materially, and, no doubt, so much sooner, brought about the sought-for effects. Not until quite recently has there risen up one who has chosen to give equal place to the means and the end, so to speak, of Arctic exploration.

Deltus M. Edwards' "The Toll of the Arctic Seas" is a book of fascinating and unbroken interest. Mr. Edwards' reference to the remoter Arctic work is but brief. He quickly gets down to the more definite records. Barents, Hudson, Bering; Franklin—a name inseparable from Arctic work—and his the greatest toll exacted at one stroke; Kane and Hayes, and the many Franklin Search Expeditions, McClintock's notably; Hall, Nordenskiold, De Long, Greely, Nansen, Andree, Sverdrup, Amundsen, Erichsen, Peary; *and* Cook, whose record in this field of work is no mean one, all pass in review "with a measured beat and slow." Mr. Edwards faithfully and sharply mirrors the almost superhuman feats of endurance, the self-sacrifice, the devotion to each other of commanders, officers and men, so many of whom gave their lives, not for gold nor yet for fame, but at their country's call equally for the expansion of commerce, and the advancement of geography and its resultant sciences.

In the bright glare of present-day achievements the work of these pioneers has become dim. Nay, with a single exception or two, has been almost wholly forgotten. But few recall that from the results of their labours and successes have been built up the successes of to-day. Against what tremendous odds worked those last century explorers. Theirs were sailing ships, not steam driven; ships blown here and there by the winds and buffeted by the ice. And yet, despite all this, how much was accomplished. Ross in 1818 sailed as far north as the entrance to Smith Sound, to which point there was no record of any exploration since Baffin sailed there more than 200 years before. And Parry, in 1819 and 1820, entered Lancaster Sound, and penetrated farther west than anyone before him. In 1829 Ross set out on his memorable voyage resulting in the location of the Magnetic Pole; and not until then was steam used. But with an effect farcical almost from the outset, for in less than four months the engine was taken out and left on the ice because "it was not merely useless, but an encumbrance," and with "a degree of power far inferior to that of any preceding vessel engaged in these services" (wrote Ross), the excellent work of the following four years was completed. So circumstanced were these earliest of 19th century explorers; and no greater credit redounds to any than to these who in battle against almost the whole forces of nature achieved so much.

Our only regret in reading Mr. Edwards' book is that he has made so little of the earliest of the explorers. We, in fact, deplore the meagre references to them. We cannot excuse the author on the ground that he defines " Toll " as meaning the tax paid to these relentless regions in flesh and blood, for he includes the names of Sverdrup, Abruzzi, Amundsen and Peary, who passed through hardship incomparably less severe and disastrous than those of Franklin, Kane and Hayes, De Long and Greely. We must confess we have to seek another definition of " Toll," and a reason, therefore, for the slight references to Ross and Parry in particular. We admit, of course, that from the general reader's point of view, the voyages of the latter two are perhaps among the least eventful, and so least interesting.

We notice that the illustration of De Long has been reversed in reproduction from the original work. Barents in place of " Bering " at the top of page 37 is only a slight typographical misplacement, but is misleading. And we would like to have seen direct connection between illustration and reading matter, making the former more forceful and the latter even more interesting.

The print is clear, and the pages have been given good margins. In fact, the whole get-up of the book is excellent. We warmly commend Mr. Edwards' effort. W.H.W.

" The Climate of the Continent of Africa." By Alexander Knox, B.A., F.R.G.S. With Annual and Monthly Rainfall Maps. Cambridge University Press, 1911.

This volume of over 550 pages will be of inestimable value to travellers, and will form a valuable work of reference for students and teachers, containing as it does, suitably arranged, practically all that is known on the subject with which it deals.

The Rainfall Maps are first dealt with in a clear and exhaustive manner. Then the general climatic conditions are considered for each month, after which the various countries, colonies, and protectorates are treated in detail in separate sections, grouped into four great divisions: North, Tropical West, Tropical East and South. Each section being completed by climatological tables, the rainfall at the selected stations being given last.

In order that the climatic conditions of the home countries of intending emigrants or travellers may be compared with the parts of Africa proposed to be visited, tables for the capitals of the countries which have the greatest territorial interest in Africa are given in the Appendix.

In addition to the above, and very important from a commercial point of view, there will be found at the end of each section some notes on the productions of the country included in the section.

The author states that but for the help of the Royal Geographical Society, the book could not have been produced, and that the Royal Colonial Institute, The African Society and the Royal Meteorological

Society also gave valuable assistance, and he specially notes that this united action, which is practically necessary for a work of this kind, is almost unique and augurs well for the future.

"A Nook in Galloway." By Thomas Newbigging. 12 illustrations.
Gatehouse-of-Fleet, N.B. : J. R. and A. Kirkpatrick, 1911.

This account of a somewhat unknown corner of South West Scotland, about which the author has special and intimate knowledge, is of absorbing interest.

The geographical references found therein fit it for a place on our shelves, but the historical reminiscences of the district and of its natives and visitors form its chief feature, and, as will be expected from the many previous writings of Mr. Newbigging, its literary merit is an additional attraction.

The further fact that the author has long been a member of the Society should have some effect in leading his fellow-members to peruse this addition to the library.

The following lines, which seem to be part of either a preface or a table of contents may well serve as the latter :—

" Land o' birk and rowan tree,
Land o' fell and forest free,
Land that's aye sae dear to me—
Bonnie Gallowa'."

The Journal

OF THE

Manchester Geographical Society.

* * *

SOME GEOGRAPHICAL PROBLEMS OF THE MID-PENNINES.

By Albert Wilmore, D.Sc., F.G.S.

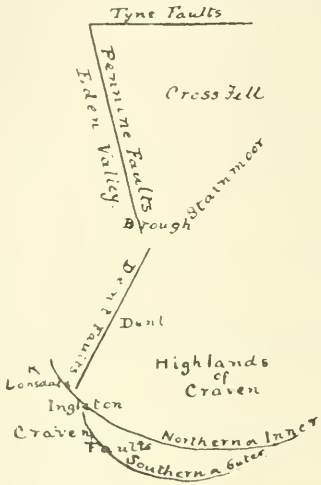
(Addressed to the Society in the Geographical Hall, on Tuesday, February 7th, 1911.)

The lecturer held that the Pennines may be divided into northern, middle and southern. The northern Pennines he defined as that part north of the system of faults known as the Craven Faults.

Commencing at the "Tyne Gap," where the Roman wall of Hadrian stretches from near Carlisle to Newcastle, and where in modern times the North-Eastern Railway local line follows almost the same route, are the Tyne-Stublick Faults with a downthrow to the north. The Pennine Faults cut off the masses of the Cross Fell group from the Eden Valley. These extend from N.N.W. to S.S.E., and have a downthrow to the west, as may be very clearly seen at Melmerby, Brough-under-Stainmore and other places. South of this come the Dent Fault or Faults, with a S.S.W. direction and a downthrow in the opposite direction to the Pennine Fault system. Finally, we come to the Craven Faults which the Dent Fault meets in the neighbourhood of Barbon and Casterton near Kirby Lonsdale. The Craven Faults consist of an "outer" and "inner" fault, which in the north are pretty close together, then they widen out and later approach each other in the Wharfedale region. The Craven Faults start with an almost north and south direction, then swing round and eventually become almost east and west, finally dying out in the moorlands near Pateley Bridge.

This northern Pennine fault system has, as pointed out by Prof. Kendall, somewhat the shape of a reversed figure 3; thus

Diagram of the Northern Pennine Fault.



The Craven Faults, with a number of smaller adjustment or accommodation faults, throw down successively to the south. Here begins the lowland country of Craven, or the Bowland Province, as it is termed by the geologists. This is the beginning of a country very different in character from the tabular country to the north, for here are folds with a direction roughly N.N.E.—S.S.W., the dominant ones being the Clitheroe and Rossendale anticlines with the syncline of the Burnley coal field and of Laneshaw Moor between them.

The country thus determined by the Craven Faults to the north and to the south by the great masses of grit moorland which culminate in the Peak of North Derbyshire the lecturer defines as the Mid-Pennines. One part of it has had the original covering of coal measures and millstone grit largely removed, and dissection has proceeded so as to expose in the fold the lower carboniferous limestone or Tournasian beds of the stratigraphers. The hummocky or knobbed country traversed by the Midland main line from Skipton to Hellifield, an interesting triangular patch of country, with Skipton, Clitheroe and Hellifield roughly at its angular points, and with modified extensions into Wharfedale and Airedale, shows not only the N.N.E.—S.S.W. folds variously dissected, but traces of folds with the dominant Pennine direction. The interference effects produced by the superposition of one set of folds on the other give interesting tectonic results. The anticlinal folds with high pitch which occur close to the Craven Faults have been sources of weakness, and there erosion has cut down the Pennines to a low level. Here is the famous Aire Gap, a feature of vast geographical importance in the Pennine country. It opens eastward by the Aire Valley, as its name indicates, but the Wharfe Valley is also a subsidiary opening from the Craven Lowlands to the New Red plain east of the Pennines. On the western side this same lowland country opens out in three directions—towards Lancaster and Morecambe Bay, by the Ribble Valley towards Clitheroe and Blackburn, and by the Lancashire Calder towards Colne, Nelson and Burnley. The Leeds and Liverpool Canal uses the latter opening and winds through the rounded hills of Craven to Skipton; it then follows the Aire to Leeds.

The approach of the coalfield close to the Craven lowland country at Colne makes this southern opening industrially the most important of the western three. The Midland main line from Leeds to Skipton and the north crosses the faults and enters the plateau country at Settle, but in passing through the Craven lowlands it gives off three lines to the west, which make use of the three openings already mentioned. The Skipton to Colne line connects to the Lancashire and Yorkshire Railway at Colne, for Burnley, Accrington and Manchester. The Lancashire and Yorkshire Railway line from Hellifield to Blackburn and Manchester is largely used by the Midland for its expresses to and from Manchester and the North. This line of course follows the Ribble Valley outlet to Whalley. The Midland line from Giggleswick to Lancaster, Heysham and Carnforth utilises the northern outlet from the Craven lowland country.

This important gap through the Pennines has been in evidence in every period of British history. A Roman road traversed the gap, joining the stations of Ribchester and Ilkley and York. From the south came one or more roads to join with the east and west road not far from Colne (Colonia). In Saxon times the Northumbrian kingdom sent out a lobe which cut off the Britons of the north from those of Wales. Mackinder has well remarked that the Lancashire plain was conquered from the Britons by the Saxons of Northumbria and not by the Mercians, though South Lancashire as far north as the Ribble afterwards became Mercian and belonged to Domesday Cheshire and to the mediæval bishopric of Lichfield.

Through this Aire gap the Scandinavians, entering from the lowlands of Morecambe Bay, pushed inwards until they met the Danes who had invaded from the east, and the Craven lowlands were then the meeting grounds of the northern kinsmen. The prevalence of fair-haired Norse-featured folk in Craven is put down to the Norse invasion through the north-western outlet of the Craven country.

A Norman church at Colne and the strong castle at Skipton attest the importance of the Aire or Craven Gap in Norman times. In later Plantagenet times Henry VI was in hiding in the west part of the Craven lowlands, and was eventually "captured" near Clitheroe and conducted in ignominy to London. Later still Prince Rupert came from Oxford through the western plain and through the Gap to the ruin of the Royalist forces at Marston Moor near York. After the defeat at the hands of the Parliamentarians Prince Rupert retired to Lancashire, the Aire Gap again providing him with a passage across the Pennines.

In modern times—as witness the Leeds and Liverpool Canal and the railways already mentioned—the Gap has been of great industrial significance. We are now witnessing an invasion of West Yorkshire by the cotton trade, and the growing towns of Barnoldswick, Earby and the old town of Skipton are in Yorkshire, but belong to the Manchester province in their textile trades.

There are other types of geographical problems connected with the Pennine region. The rivers Ribble, Aire and Wharfe have battled for the drainage mastery, and at present the Aire has apparently had the worst of it. The Ribble has probably beheaded the Aire, and that part of the former river north of Hellifield seems to be a capture from the Aire system. So also the upper Wharfe north of Linton may possible have once passed into the Aire at Gargrave or near Skipton. The Aire has, however, recouped itself slightly by capturing from the Lancashire Calder one or more small subsequent streams from the Foulridge end of the Craven Gap.

Another interesting Mid-Pennine instance is from the

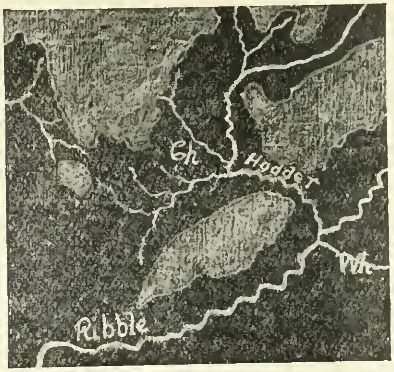


Fig. 2. Diagram-map showing the probable capture of the Upper Hodder by a tributary of the Ribble. The Hodder appears to have continued past Chipping (Ch) almost parallel to the Ribble, which it joined near Preston. Now it joins the Ribble near Whalley (Wh). The highland mass between Whalley and Chipping is Longridge Fell.

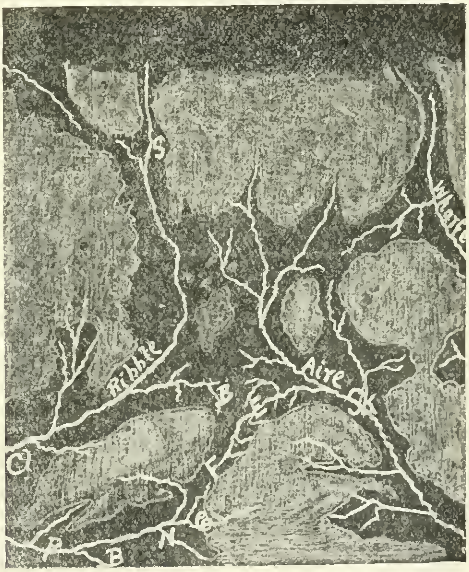


Fig. 3. Diagram-map of parts of the Wharfe, Aire, and Ribble. The Upper Ribble probably continued from Settle (S) along the present Aire drainage to Skipton (Sk).

The diagram-map also shows the Craven or Mid-Pennine Gap with its numerous outlets.

The large block of highland south of the Ribble at Clitheroe (Cl) is the Pendle-Weets mass. The towns to the south of this mass are Padiham, Burnley, Nelson, Colne, and Earby. There is a remarkable dry gap at Foulridge (F) western moorlands. The Hodder apparently once flowed straight forward from its upper valley by Chipping and near Longridge to join the Ribble near to Preston. This old course is now blocked by a line of moraines at the Longridge end, and the Hodder has cut a gorge out to the Ribble at Whalley. (See figures 2 and 3.)

The rainfall of the Mid-Pennines is, like the topography, very varied. On the whole, of course, the western part has a higher rainfall than the eastern part, but there are many interesting local "rain shadows." The Longridge Fells give to Stonyhurst its high average of some 47 ins. a year. So also the Pendle Range show an average fall at Ogden of about 47–48 ins. per year. There is a bay of lower rainfall, however, which extends up the Ribble and through the lowlands of Craven, and another up the Calder Valley to the low moorlands east of Colne where the rainfall shows a rapid diminution. Colne receives about 40 ins. a year, but on Laneshaw Moor immediately to the east the total has, according to recent records, fallen by several inches.

TRAVELS IN AFRICA'S WONDERLAND.

By Broome P. Smith, F.R.G.S.

(Addressed to the Society in the Geographical Hall on Tuesday, February 14th, 1911.)

The whole of the territories which I am about to describe have been visited by me many times, and, as I look on the recent administration in West Africa, it seems almost incredible that this region, with its inhabitants, has been so transformed from what it was in the past. To one who had the opportunity of seeing some of these countries as I have seen them, the marvel was only increased.

The Gambia River Protectorate, which is three days steaming north of Sierra Leone, includes the Island of St. Mary and McCarthy's Island, the latter being 200 miles up the river. This river can be entered by large vessels and is navigable for four hundred miles from the coast, but the country, through which this river runs, is for the most part very flat. Jolufs, Mandingoes and Fulahs are the principal tribes. The last mentioned devote their time principally to the herding and rearing of cattle. The principal languages are Joluf and Mandingo, being unclassical Arabic. The staple industry of the country for export consists of ground nuts.

The Crown Colony of Sierra Leone, with Free Town the seat of Government, was ceded to Great Britain for a purely philanthropic purpose in 1808. The principal portion of this Colony is very mountainous, some of its heights rising to almost four thousand feet above the level of the sea. This Crown Colony has had the reputation, for the last one hundred years, of being the White Man's Grave. But this is no longer a fact. For, thanks to the Right Honourable Joseph Chamberlain, a marvellous change has come over this, and also over the Colony of Lagos, which was long known as one of the most unhealthy of British possessions, when Sir William McGregor undertook similar measures against malaria. In both of these Crown Colonies, great difficulties had to be contended with in draining the low swampy territory.

Cape Coast, a town of eight to ten thousand inhabitants, was full of filth and unwholesomeness. Situated in a gorge or chasm in a high bank of red clay, which was covered with jungle, Cape Coast, one of the principal towns of the Gold Coast, has been put on an immensely improved footing through the efforts of Sir Mathew Nathan, and Chambers of Commerce have reported very favourably of the results. And it is to the honour of Mr. Chamberlain that we are all so much indebted for his far seeing and powerful efforts for the sanitation of these Colonies.

No important industrial enterprise, in conjunction with the efforts of missionary and technical education, the value of which must not be overlooked, has ever been started with more intelligence and forethought than railway construction.

An improved knowledge of the geography and topography of West Africa has naturally followed.

The development of our largely unexplored British possessions, such as the Colonies of Sierra Leone, the Gold Coast and the Slave Coast, has recognised this valuable fact, that moral and enterprising work has been done by missionaries and government schools. These agencies have also been the means of suppressing tribal revolts and inter-tribal warfare, slavery and other barbarous customs. These beneficial results have also been brought about, in a greater or less degree, by such means as military and exploring expeditions. But the efforts of missionary work, mercantile enterprise, mining operations and technical education in the government schools have each and all of them served the purpose of promoting trade relations between important centres. It was only in 1898, when calling at Free Town during a voyage from the Congo, I heard that the native insurrection then was accompanied by the most terrible outrages upon the Europeans within the affected area. But now, with over 200 miles of railway, any future rising would be promptly suppressed, since troops could reach the disturbed areas within a few hours. Again, the Ashanti war, which has been most costly to England, is unlikely to occur again now that Kumassi is placed within two weeks' journey from England and a few hours' journey from the coast. This again is largely due to the fast line of steamers sent out by men like the late Sir Alfred Jones, K.C.M.G. Travelling constantly among, and with the Africans, it is most interesting to study them in their primitive state, as I first knew them, apart from foreign influences. The native, by himself, is devoid of all skill and education, possessing but little energy and if left to himself will be content to learn nothing and will aspire to nothing but simple husbandry, which supplies him with his food and a small surplus for barter for clothing. But the railway department in each Colony, in addition to the educational work of missions, has done much to train him. Now we see the technical instruction of the natives in skilled labour has been called into use for the erection of steel work, station building and workshops. Each of these and many other branches have advanced them and educated them in civilisation and enabled them to become useful subjects of our Empire. So that we now see them fulfilling the duties of station master, guard, porter, timekeeper, accountant and telegraphist, with considerable success. When I was travelling on the Congo railway I met a large number of Mendi and Timni natives from Sierra Leone who were teaching the Congolese the railway work, in which they themselves had been trained. Finally, however, the recruitment of labourers to the Congo was stopped. In the growth and development of cotton, coffee, and cocoa plantations the railway from Accra to Mangoase, thirty-five miles into the centre of the cocoa plantation, has opened up a large tract of country, suitable for the growth of tropical produce. In Sierra Leone and Lagos large tracts of land suitable for the cultivation of cotton are now opened up by means of railways, and with properly directed efforts can be turned to good account. The distinguished District Commissioner of Sherboro, Mr. T. J. Alldridge, who has had thirty-three years experience in the Sherboro Protectorate of Sierra Leone, expressed the opinion that much might be done by encouraging the native industry.

Continuing along the Coast, the first place of importance is Axim, and twenty miles further east is Sekondi, one of the old trading stations of the Dutch, which in 1894 was a mere native fishing village. But to-day machinery of any weight can be transhipped from the steamer to the train and delivered at Tarkwa, one centre of the gold mining district, or at Obuassi, 126 miles away, the headquarters of the Ashanti Gold Mining Company. One hundred and sixty-eight miles by railway from Sekondi is situated Kumassi, in 6° 35′ N., 2° 12′ W. Again north-west from Kumassi another gold mining railway has been opened to Prestea, on the Ankobra River, which river eventually discharges its waters into the sea twenty miles west of Cape Three Points. From Cape Coast tortuous bush-tracks were the usual means of internal communication, but there is now a well constructed road from Cape Coast to Kumassi, one hundred and forty-one miles. On the road to Kumassi I visited the Tarkwa and the Obuassi mines in 1901 and 1902. The name of Kumassi is derived from a well-known tree growing in the town, viz., Okum.

The construction of the railway to Kumassi was no easy matter, owing to excessive rainfalls, physical obstruction in the dense tropical forest, as pointed out to me by Mr. Stanley, the civil engineer of the Tarkwa division, and finally the Ashanti war. It would be impossible to speak too highly of the policy and energy of the Colonial Office initiative, and the technical knowledge of those on whom the success of the work depended. The right man was in the right place, and as a consequence we now recognise rapid commercial development. There is regular telegraphic communication organised along the Gold Coast, which is so named from the precious metal found in the interior. This Colony extends from Assini on the west to the River Volta on the east. It is bounded on the west by the Ivory Coast territory, French, on the east by Togoland, German. The combined area of the Gold Coast, Ashanti and Northern territories is about eighty thousand square miles. The capital and Government headquarters of the Gold Coast Colony since 1876 have been at Accra, a port in the Gulf of Guinea in 5° 31′ N., 0° 12′ W., population about twenty thousand. Formerly the seat of Government was at Cape Coast, 5° 5′ N., 1° 13′ W., eighty miles from the present capital. Accra has a sea front of over three miles, but its harbour is not equal to that at Cape Coast. Good roads abound in every direction and many can be travelled over in Jinrikishas. This is also the only point in the Colony where horses thrive well. One of the best known inland towns is Akropong, about forty miles north-east of Accra, standing 1,400 feet above sea level. Many a Government official and trader, who is run down in health, will regain strength in a few days by paying a visit to Aburi in the Aguapim Hill district, twenty-six miles north by east of Accra. There the Government have built a fine sanatorium and laid out magnificent Botanical Gardens.

It is clear from the zeal of her sanitary work upon the West Coast that England wishes to develop her trade in West Africa.

For she hereby has given an assurance to Englishmen that they have a reasonable chance of living there under healthy and comfortable conditions. During my several journeys into the interior and along the coast, I met with Government medical men and medical missionaries, and I could see that these authorities are now fully alive to the advisability of attacking all tropical diseases. If there had not been a fully qualified officer at Saltponds, a small West African coast town, I should not have survived the attack of blackwater fever which was so serious that my life was despaired of for five days (to be eventually so well cared for by the medical staff at Cape Coast Hospital). I am sure that no medical officer could have travelled and studied more carefully the condition of sanitary affairs and put forth a greater effort to improve them, reporting directly on the subject to headquarters, than Dr. Arthur Horn of Saltponds. He never found it a difficult matter to educate his native dresser and assistants, so that others are growing up with him and will be of practical value in malarial diseases and sanitary work in the future generation.

At the mouth of the Volta River is the town of Addah, but numerous rapids in the river prevent boats of large size passing up north more than sixty miles.

Togoland, German territory, has only a coast line of thirty-two miles in length, it widens out in the centre and again narrows down to about the same length as the coast line and extends inland for three hundred and fifty miles. The Ewe people originally came from behind the Cameroon mountains. Trade routes ramify everywhere throughout the length and breadth of the country. The roads over which I travelled were excellent and cost over £200 a mile to construct. I journeyed nine hours along the beach from Lome, the capital, to Ketah, suffering slightly from the burning sun. A former three years' war between the Pekis and Akwamus interrupted a good deal of trade, and the Akwamus, being unable to pay their taxes, degraded themselves by giving up men, women and children to their conquerors.

Going on to Waya, two days journey from the coast, I had to cross from Ketah, where there is a large lagoon which has to be passed over to reach the mainland at Anyako, and not even a sail or umbrella is allowed to be put up or opened. If I had had a horse and carriage I could easily have driven to Waya from Anyako, as there was nothing but fan palms on each side of the road. I rested a few days at Ho, from there to Agu Nyogbo, one thousand feet above sea level, a large and thickly populated district lies in all directions, on the journey thither I used two horses. This town is about one thousand miles south of the great desert Sahara, and in the dry winter season the sand from the desert is blown as far south as Agu Nyogbo. Pressing on we reach Amedzove town, which stands two thousand feet above sea level and is the most healthy and beautiful locality that I saw in Togoland. The mountain here rises gently from the plain to a noble range, and the summits are covered with heavy forests of hard wood. Down in the valley many towns are seen, and Agu mission station, fully eleven hours journey distant, is plainly visible.

Looking at the town of Lome from the steamer on the right is the Roman Catholic Church, the finest on the West Coast: it is built in the style of the cathedral at Cologne. They have a good landing pier here, and the Governor's residence is equal to the Governor's residence at Lagos. The Ewe people had a peculiar manner of declaring war with another tribe. One chief would send a stalk of corn, a handful of salt, and some lead bullets to his enemy to choose from. If the corn was accepted the receiver would have to pay men, women and children, according to the number of grains on the stalk. If the salt was chosen, then peace reigned between the two, but if the bullets were retained war was at once declared. The River Volta flows north and south, and has many feeders before entering the sea. The Todzie and Aka Rivers empty into the Quittah Lagoon. The Todzie River at Wute has during the rainy season rather a nasty crossing, which I unfortunately experienced. The chief mountain range stretches from the River Volta, north-east of Peki, beyond the Ewe country.

One of the physically finest, as well as most interesting and intelligent tribes to be found amongst the West Coast tribes are the Hausas. They are a peaceful, sober, industrious and agricultural people. Their women make splendid hammock carriers and baggage bearers, being of a strong physique. The men have developed a certain military skill, having been driven to protect themselves from other tribes, who made inroads into their country, which lies to the north of Nigeria.

To-day, under good leadership, the Hausas make good soldiers for our West African possessions. Their power of endurance is great, for when a Hausa carrier has once put his load of 90 or 100 pounds on his shoulder, it never touches the ground again until he has reached his destination. His load is generally so arranged that when he wants to rest and eat, he places one end on the roof of a house, or on the fork of a tree, whilst supporting the other end on his staff.

The Hausa industries comprise weaving, dyeing, skin tanning, leather and metal work. In Free Town and Lagos, the Mahommedan Hausas have built large Mosques and schools at a great outlay.

In the pursuit of my work I have travelled through some dense and thorny jungles in the hinterland of both the Gold Coast and the Slave Coast.

Large logs of mahogany are shipped from Axim in great quantities, being floated down the Ankobra River in rafts. I have also seen what splendid work trained Ashanti men can do in preparing timber for building purposes. Unfortunately, one realises, in passing through the forest, what an amount of timber is wasted by the natives as indicated by the remnant of stumps left in their clearings for plantation work.

In travelling through the bush to Kumassi many dangerous pit shafts have to be avoided. These are about four feet square, from which in a very primitive manner the Ashanti and his slave obtained their precious metal gold, which gave the name to the Gold Coast. It is a well known fact that at Axim the incredulity of a lady was rudely shaken when on challenging the natives to find gold on the beach, as had been stated could be done, it was proved, after continued washing, that specks of the precious metal were to be seen in the pan. And the lady graciously acknowledged that she was wrong.

In the course of my journeyings I visited most of the schools, and I might mention one geographical incident which occurred during my intercourse with these native scholars. I had been examining the children and endeavouring to carry their minds to England, and I soon found that I had a sympathetic audience. I put this question: "Can any of you tell me in what county the town of Chatham is in in England?" They knew at once. "Now what is it noted for especially?" Its shipping. "Now what is the name of the place that these ships anchor in?" Oh, in a dockyard. Good. "What is a dockyard?" None could answer that question. Finally one, who thought herself cleverer than the others, raised her hand. I stepped down, proudly picked her up and stood her on the platform, to tell her older companions what a dockyard was. When I repeated the question to her she quietly looked up in my face and said it was a place all the same as where her mother kept ducks! How different was my first contact with heathen degradation in 1894 at Bonny, on the Niger Delta, amongst the Ibo tribe. After addressing a large native assembly, a little girl came forward welcoming me very warmly to West Africa. Her wrists and ankles were raw, owing to the cruel practice of fetishism or witchcraft. The facts were these, both of the child's parents were dead, and Archdeacon Crowther, son of the well-known African slave, Bishop Crowther, who was himself once a poor slave boy in the hands of the Portuguese, adopted and took her into his house. But unfortunately, one day, whilst outside the Archdeacon's house, she was seized during her foster parent's absence and bound by chains to a stake in the river (which I had noticed and enquired what its purpose was on account of the chains) to be destroyed by crocodiles, simply because she had renounced her belief in witchcraft. Happily, just a few days previous to my visit, she had been released by her foster parent. During these years of constant travelling along the West Coast and in the hinterland I met with, and heard of, many unusual sights. Some secret societies are very closely united by a strong feeling of brotherhood, whilst outsiders are regarded with scant esteem. In this case a young man, who was to be initiated into witchcraft, was laid upon the ground and told to chew the root of a certain plant given to him. This produced drowsiness, and the lad as he kept chewing it, became more and more unconscious. We may imagine with what anxiety the natives watched him and tested him from time to time, until he appeared to be altogether insensible to any outward impression. Then four men, having raised him on to their shoulders, carried him farther away into the bush. This inner place was unfrequented, weird and enclosed by the gloomy forest—here was a shrine and a kind of altar. The men who carried the unconscious lad stood before the altar and then deliberately and with violence threw their burden to the ground. The shock of the fall aroused the lad, who started up in horror at the scene before him, and, hearing a strange language, which none can understand, except those who have been through the initiatory order, finally with a wild howl fled into the forest. Then for a year the youth remains with the brotherhood school and is not allowed to speak to any one except those of his own brotherhood and learns the power of the different fetishes or charms.

Eventually he returns to his own tribe and is from that time regarded as a capable man. In Kumassi all these horrors of African paganism, with its countless fetish laws and with all the places of horror and decay, have now been swept away and every trace of them removed, as the late Sir Donald Stewart, K.C.M.G., pointed out to me when I had the privilege of enjoying his company and hospitality in Kumassi fort. What was once known as the place of skulls has been transformed into a modern market place, and only a number of trees remain to mark the spot.

Passing down the coast I came to Dualla, visiting Victoria, with its enormous German Botanical Gardens, employing about one thousand hands, I then ascended the Cameroon Mountain to Buea, passing on to Bombe, Nyassoso, and Mangamba, afterwards I steamed up the Sanaga River, calling at Lobethal and Edea. The Sanaga River, running to Edea, is a splendid waterway; we passed through the Kwa Kwa, which connects it with the Kamerun River, and at the town of Edea the waterfalls cover a greater space than the Canadian Niagara waterfalls.

My journey south, of about seven hundred miles, occupied eight days. We then entered a river, which is considerably over three thousand statute miles in length, and reached Banana, one of the best natural harbours on the West Coast of Africa, capable of sheltering vessels of the largest tonnage. I was somewhat surprised, on asking Captain Thompson of the S.S. "Cabinda," when we should be in the Congo River, to be informed that we were then in it, and that fresh water was to be had for the asking. I had certainly noticed the discoloration, so a quarter-master attached a rope to a bucket, threw it over the side, and I had the satisfaction of drinking some fresh water two hundred miles out at sea.

I could quite imagine now, after entering the Congo River four times or so, that such a vast body of water poured into the Ocean would change the colour. The mouth of the Congo River is about seven to ten miles wide, and the volume of water pouring into the Atlantic is estimated as only second to that of the Amazon.

Banana town is surrounded with cocoanut trees and the houses, belonging to the Government officials and traders, are built upon piles, which are driven into the sand. There are plenty of stores and one good Hotel. A splendid lighthouse is situated on Banana Point, and the Governor has a fine summer residence facing the Atlantic.

From Banana, the Portuguese settlements of St. Antonia and Cabinda can be seen, and from both these places permits have to be obtained from the port official before anyone embarks on a steamer. Passing up the Congo River to Boma, we noticed Chinkakassa Fort, this fort having been erected to protect the river below the Yalala Falls.

At Boma are situated the headquarters of the Administrative Government and the residence of the British Consul. A light railway proceeds from the wharf or landing stage, runs through the main street and trading centre, past the native hospital, up to the Governor's residence, European Hospital, High Court of Justice and many Free State officials' residences upon the plateau.

Trading stations, the general post office, which was formerly a big hotel, and a large mission house are seen along the river front. Passing up river, we see several native towns until we reach Musuko, a Portuguese trading post on the south bank, then proceed for about ten miles through what is known as the Devil's Cauldron, otherwise very strong rapids, when we sight Underhill Station, belonging to the Baptist Missionary Society of London, the ever welcome resting place for passing missionaries and travellers. Two miles further on we reach Matadi, the limit of Ocean navigation. Here all the valuable wealth of the country, viz., palm oil, palm kernels, rubber, ivory and ground nuts is shipped on board and exported. Matadi is the starting point and terminus of the Congo Railway. Travellers, pioneers and missionaries, who used formerly to travel either in hammock or on foot, took forty to fifty days from Matadi to Leopoldville, Stanley Pool. On this journey they encountered great difficulties through the almost impassable rivers and the mountainous country. Now the journey is easily and comfortably accomplished in two days or less by train, which is a wonderful difference.

The railroad between Matadi and Leopoldville is two hundred and fifty miles, and was begun in 1889 and finished in 1898. It mainly passes through a fairly open country, but the engineers had great difficulties to contend against at the start, in their constructive work, from the rocky and precipitous nature of the land through the Palabala Hills.

On one occasion I was bringing a sick missionary from an interior town, and knew that my carriers had never seen or heard of a train. Towards our journey's end, and being anxious to push on with my invalid, I urged on my carriers by assisting with the hammock. As it was about ten p.m. I had no hesitation in walking on the path between the embankment on the railroad, as I considered no train or even engine would be running, and that all traffic would have ceased. Passing quietly along, with the lantern carried in front, I suddenly heard the whistle of an engine as it was coming round a curve and approaching us from behind. My carriers became alarmed and with terror depicted on their faces let go the hammock which I fortunately had hold of and jammed the pole into the embankment whilst they took to their heels. This meant a serious delay of over two hours, and was annoying because a bed and kind helpful faces and hands were awaiting us at Tumba, but eventually the runaways overcame their fright and returned to finish the journey. Tumba, which is now named Thysville, is half way to Leopoldville from Matadi. Major Thys was the chief director of the Congo Railway Company. He was a very able man for the work—I enjoyed his company very much and also his lunch one day, which he kindly invited me to partake of with him, on a flat construction car, seated on boxes of spikes with other cases containing railroad material for our tables. In mastering the Congo language, which took me some years, I laboured under the disadvantage of being already acquainted with the Malagasy and other South African languages. Whilst learning a strange language, one has to be continually holding a notebook in hand and jotting down every new phrase and word. In about four years I had collected a vocabulary of over one thousand words, and in this way only, and through constant intercourse with the natives, Europeans are able eventually to express themselves in the language of the country. Besides the language difficulty, there was the work of opening out new districts and building comfortable and healthy houses, which entailed the making of bricks and procuring timber for building purposes, either from Europe or the forest. Then journeys had to be planned and carried out, which in a country like the Congo State implies a good deal of roughing. There is a great and very unpleasant difficulty to contend with in travelling through the country, which is the enormous height of the thick grass, which grows on the great plateaus and in the valleys. This attains to the height of fifteen and twenty feet and consequently where the top overlaps the path, the traveller is walking through a kind of tunnel which makes the path difficult. Then along some of the banks of the rivers are miles of swamps, full of decaying matter and mangrove trees, with their roots intertwined, which spell to new arrivals—malaria. Some days we pass through a great belt of palm trees, from which bunches of nuts grow and from which palm oil is extracted. We see the natives tapping another tree of the same species to procure the sap, which after fermenting for twenty-four or thirty-six hours, becomes intoxicating. Large quantities of this beverage are drunk by the natives on the Congo and in the Yoruba country (Colony of Lagos). As luxuriantly as the silk cotton tree grows in the Gambia and Sierra Leone Colonies, so does the baobab tree in the Congo State. These trees measure eighty feet in circumference. On the north bank, across the river from Matadi, is Vivi, built by the late Sir H. M. Stanley, one hundred and twelve miles from the mouth of the Congo. This was the main starting point for the inland stations Isangila, Manyanga, the Cataract and Pool district.

In 1896, I was appointed head of a party to go eastwards, being desired to open up a chain of stations from Matadi to Lake Tanganyika. Before reaching Popocabaca on the Kwango River, I rested at Tungwa, Thysville, Ntumba Mani and Makuta. This latter place was where the Baptist pioneer missionary, Mr. Thos. Comber, was seriously wounded in the back with a bullet. But on my visit everyone was most kind, and the old chief, realising the mistake, after so many years, expressed his sorrow to me saying, that, at the time of the occurrence, they did not know that they were shooting at a man of God. The country round is very populous and important mission work is being done in this district. But after covering two hundred miles or more I was obliged to return partly from lack of funds, but chiefly through a change in the general organization. Some of our party had not realised the difficulties of pioneering work, as in many instances native paths exist that led nowhere, simply because of landslips, or a river changing its course. The natives in order to deceive the State people and officials who may be passing through their town or district, even cut away the low undergrowth and cut down some trees, strewing them over the path for some distance, but they know their own key path to the entrance to their town.

During one of my journeys I met a number of fine, well-built natives, seventy-five men and twenty-five women, from the district of Lake Tanganyika, and none of my carriers of the Fioti tribe, who came from the lower Congo, knew their language. When some of these natives advanced to where I was encamped to speak with me, to my amazement they spoke in the Malagasy language. My relief was great, for I could now communicate with and through them. It appeared that some of these different tribes had been some years ago captured by Arabs and sold as slaves on the West Coast of Madagascar. During my three years' stay in that island, enormous boat loads arrived at intervals, and there is no doubt that as long as the Arabs are in Africa slave raiding will be carried on. Not knowing what articles were used to trade with them, whether brass rods, cloth, knives, beads, or brass nails, I had to adopt the expedient of securing to my clothes a sample of those things that I had with me, in order that they might pick off what things they fancied. I had to ask them to retire and bring some more of their friends and visit me in the tent. Then I began to adorn my person as stated above. They had had no experience of a friendly white man. As they returned and approached my tent, one of the men picked up the lid of a packing case and knocked on it, at the same time saying, "Hodi" (Malagasy for "Friend," but in the Congo language "Nkundi"). I was simply delighted and replied in Malagasy and asked them in. After sitting a while, and during their conversation, they began, I must say very dexterously believing me to be utterly unconscious of their pilfering tricks, to pick off those things which they fancied. But it proved a clue to me as to what to offer them in bartering for food and in giving a present, as is the custom of the country.

Passing from village to village, on roads that are mere footpaths, over hills, down deep gorges, over rapid rivers on a felled tree, travelling becomes very largely a succession of ascents and descents. The vegetation is varied and the soil in most parts rich. The carefully tended soil can produce an abundance of yams, sweet potatoes, casava roots, and ground nuts. The rich green of the ground nut and sweet potato leaves are very refreshing to the European eyesight. Vegetation and fruit trees do certainly grow in untamed luxuriance, such as the cocoanut palm, lime fruit tree, paw-paw, mango-avacada pear, bananas, plantains, and in some districts, the guava. Vegetation is prolific, all of a tropical character, and there is an everlasting succession of beautiful flowers and foliage in their due season.

On a stranger's first visit to the Congo, or the West Coast of Africa, his eyes are perfectly bewildered with the panorama of beauty and colour. But in contrast with this, when the rainy season is just over, for many days it is simply walking and wading through swampy ground, and finally you have to halt for a day or two in the middle of the jungle to dose yourself with Livingstone pills, antipyrine, and quinine. Your men at times are helpless, the longing to get away from some of these malarial spots seemed hopeless, for sickness in an African jungle reduces any one to the strength of an infant. But this enforced rest gives nature fair play, and you soon recover. After a long and trying day's march you have first to look for food, then a house, afterwards pick up firewood, while what can be called drinking water has to be fetched from a distance.

At Leopoldville, Stanley Pool, the Congo River extends out into a large lake, twenty miles wide. An enormous island in the centre of the Pool presents similar cliffs to those seen in going along the English Channel at Dover. At Kinshasha, the Government have built a large fort on Stanley Pool, in order to protect Leopoldville and the railroad terminus.

Annual Meeting of the Society, 1911.

THE Twenty-sixth Annual Meeting of the Society was held, by kind permission, in the Lord Mayor's Parlour, Town Hall, Manchester, on Friday, May 5th, 1911, at 3 p.m.

The Vice-Chancellor of the Manchester University (Sir A. HOPKINSON, K.C.) presided.

A letter of apology was read from the Right Hon. the Lord Mayor (Mr. Charles Behrens).

The following were present:—Miss Crowther, Mrs. Grumbrell, Mrs. Stordy, Messrs. F. Zimmern, F.R.G.S., David A. Little, J. Howard Reed, F.R.G.S., A. Balmforth, G. I. Blake, C. A. Clarke, E. Roose Evans, J. W. Goodwin, A. W. Longden, Joseph Lunn, J. McFarlane, M.A., M.Com., F.R.G.S., T. C. Middleton, J.P., S. Oppenheim, J.P., F. S. Oppenheim, M.A., Geo. Pearson, J. Poole, A. Rée, Ph.D., J. Stephenson Reid, Sidney Smith, Harry Sowerbutts, A.R.C.Sc., T. W. Sowerbutts, F.S.A.A., W. Spencer, George Thomas, Joel Wainwright, J.P., Harold Young and others.

The Minutes of the Twenty-fifth Annual Meeting held on September 29th, 1910, were taken as read, a full report being printed in Vol. XXVI. of the Journal, page 156.

The Annual Report of the Council and the Balance Sheet for 1910 were not read, as a copy had been given to each member present; but a summary of the Report was given by Mr. J. Howard Reed, Hon. Secretary, and of the Accounts by Mr. D. A. Little, Hon. Treasurer.

REPORT OF THE COUNCIL

FOR THE YEAR ENDED DECEMBER 31ST, 1910.

THE year 1910 has been especially signalised by the loss sustained by the nation in the greatly regretted death of His late Majesty King Edward VII.

His Majesty King George V. on his accession graciously consented to become Patron of the Society, thus continuing his long connection with the Society.

The Council are pleased to inform the members that Mr. Harry Nuttall, M.P., F.R.G.S., hitherto Chairman of the

Council, has been elected President, Mr. F. Zimmern, F.R.G.S., has accepted the office of Chairman, and Mr. E. W. Mellor, J.P., F.R.G.S., that of Vice-Chairman of the Council.

The work of the Society has been carried on with considerable success during the year.

The Council were able to arrange for Rear-Admiral Peary, U.S.N., F.R.G.S., to address the members on "How I Reached the North Pole." The meeting, which was held in the Free Trade Hall on June 3rd, was largely attended, and those present were much delighted with the distinguished traveller's story of how he had attained the object to which he had devoted the last twenty-three years of his adventurous life.

The Council desire to express their thanks to the Right Hon. the Lord Mayor (Mr. Charles Behrens), for his kindness in entertaining Rear-Admiral Peary during his visit to this City.

On October 11th Dr. M. Aurel Stein, F.R.G.S., the celebrated Central Asian explorer, gave an account of his geographical and archæological discoveries to the members of the Society in the Chemical Lecture Theatre at the University. The thanks of the Society are due to the Vice-Chancellor and the Council of the University for kindly granting the use of the room.

The meetings of the Society have been very successful and well attended.

The comprehensive character of the lectures delivered during the year, all of which were illustrated with lantern views, will be realised on reference to the detailed list given below:—

"Through the Lakes with a Knapsack." Mr. F. Stevenson.
"A Walking Tour in the Tyrol." Mr. W. Thompson.
"Tour through Northern Persia." Mr. W. Leonard Flinn.
"Explorations in Central Asia." Dr. M. Aurel Stein, F.R.G.S.
"Sixty Days Marching through Ladak and Lahoul." Mrs. Arthur Schuster.
"From India to Burma." Mr. H. N. Morris.
"John Chinaman: being an account of a walk in Southern China." Mr. Harold E. Young.
"Eastern Impressions." Mr. Wm. Robinow.
"Five Weeks in the Soudan." Mr. L. Emerson Mather. F.R.G.S.
"Sierra Leone as an Asset of the Empire." Rev. Canon F. C. Smith. M.A., F.R.G.S.
"The New South Africa." Mr. J. Howard Reed, F.R.G.S.
"My African Journey—Capetown to Beira." Mr. T. A. Edwards.
"The Wonderland of Alaska." Mr. J. E. Liddiard, F.R.G.S.
"From Winnipeg to the Arctic Ocean." Miss Agnes Deans Cameron.
"Mexico, the land of Romance and Beauty." Rev. J. Johnston, F.R.Hist.S.

"The Panama Canal." Alderman Sir Bosdin T. Leech, J.P.
"Venezuela." Mr. W. H. Zimmern.
"Wanderings in the South Seas." Mr. F. W. Christian.
"The Volcano of Matavanu in Savii." Dr. Tempest Anderson, F.R.G.S.
"The Philippine Islands." Madame G. M. Vassal.
"How I reached the North Pole." Commander R. E. Peary, U.S.N., F.R.G.S.
"British Cotton Growing." Mr. J. Howard Reed, F.R.G.S.
"Trade Routes—Past and Present—East and West." Mr. Richard Kalisch, F.R.G.S.
"The Fascination of Geography." Miss Kate Qualtrough.

The Council thank Colonel E. W. Greg, J.P., F.R.G.S. and Mr. Joel Wainwright, J.P., and their ladies for their kindness in so hospitably receiving the members during the summer.

The Council also thank Principal Reynolds, of the Municipal School of Technology, for the invitation to inspect the Photography and Printing Crafts Department, and are gratified that so large a number of members took advantage of the opportunity to see the facilities provided for instruction in these subjects.

The Journal for the last three quarters of 1909 has been issued during the year.

Further valuable additions to the library and map-room have been made. The Council would highly appreciate gifts of new geographical books, as they have so far been unable to devote funds to the purchase of such works.

The Victorians have performed useful service by lecturing for affiliated Societies and for members, also by arranging social gatherings. The Society is indebted to the Victorians for their services as stewards at the meetings held in the Free Trade Hall and the University.

The Council thank their devoted colleague, Mr. E. W. Mellor, J.P., F.R.G.S., for his invaluable help with his fine lantern in the Free Trade Hall on June 3rd, 1910.

The Council desire again to express their indebtedness to the member who defrays the expense of the special prize awarded on the result of the examination in Geography at the University of Manchester.

Mr. J. Howard Reed, F.R.G.S., the senior Hon. Secretary, was, as in previous years, appointed the delegate of the Society at the Meeting of the British Association for the Advancement of Science held this year at Sheffield. The address which he gave on "Cotton Growing within the British Empire" attracted much attention in the press and brought this Society into special notice. Mr. Reed has given addresses on this subject before the Royal Geographical Society and the Hull Geographical Society and has been invited to lecture on the same subject to the Royal Scottish Geographical Society.

The Balance Sheet for the year, with the report of the Hon. Auditor, is presented herewith.

The Council greatly deplore the loss of members by death. Among the losses which we have sustained may be mentioned:

Mr. B. C. Alexander.
Mr. James Barningham.
Mr. R. Hope Brown.
Prof. T. H. Core, M.A.
Mr. A. Goodwin.
Mr. S. L. Helm.
Mr. John Mather, F.C.A.
Mr. C. V. Meyer.
Mr. R. N. Michaelis.
Mr. J. D. Milne, J.P.
Rev. S. Alfred Steinthal, F.R.G.S.

Mr. B. C. Alexander, Prof. T. H. Core and the Rev. S. A. Steinthal were original members, and the Council desire to place on record their appreciation of such long and consistent support. It is scarcely necessary to remind the members of the valuable services which the Rev. S. A. Steinthal rendered to the Society first as Vice-Chairman of the Council, then for 19 years as Chairman, and for many years as a Vice-President, and in addition as Editor of the Journal for the last five years. It is impossible adequately to estimate the value of his services, but as an instance of his interest and enthusiasm it may be noted that he read the proofs of the Journal to within a week of his death.

Mr. Egbert Steinthal has consented to act as one of the Hon. Secretaries in order to help the Society as Editor of the Journal.

In conclusion, the Council desire to remind the members that additions to the membership are essential to enable the Society adequately to continue its work.

Lack of funds has made it impossible for the Society to extend materially its operations, but with the increased support of the present members and with the addition of fresh members there is every prospect of an even more useful future for the Society.

REVENUE ACCOUNT.

YEAR ENDING DECEMBER 31st, 1910.

Dr.

1909. £	s.	d.		£	s.	d.
104	*3*	*2*	To Expenses of Meetings	108	2	0
120	*2*	*4*	,, Journal, less sales and advertisements	86	1	3
140	*12*	*8*	,, Rent, Lighting and Insurance	140	9	9
104	*5*	*0*	,, Salaries	110	10	0
101	*16*	*8*	,, Wages and Sundry Expenses	108	6	7
12	*2*	*5*	,, Commission and Expenses, New Members, and Collection of Subscriptions	10	18	2
5	*11*	*11*	,, Books, Maps, Binding, &c., Library	4	13	3
3	*1*	*7*	,, Repairs to Furniture	11	2	0
			Balance Carried to Balance Sheet	16	9	5
				£596	12	5

Cr.

1909. £	s.	d.		£	s.	d.	£	s.	d.
			By Members' Subscriptions :—						
31	*10*	*0*	Life (Transferred to Reserve Account)	31	10	0			
490	*7*	*0*	Ordinary	511	7	0			
55	*18*	*3*	Associate	51	19	6			
14	*14*	*0*	Societies	14	14	0			
							578	0	6
3	*14*	*6*	,, Victorians				2	12	0
3	*15*	*0*	,, Hire of Chairs						
7	*0*	*1*	,, Dividend on Shares in Bldg. Co.				11	1	3
			,, Interest on Loan to Bldg. Co.				1	5	0
2	*0*	*11*	,, Bank Interest				2	12	8
3	*7*	*9*	,, Donations				1	1	0
							£596	12	5

BALANCE SHEET, DECEMBER 31st, 1910.

LIABILITIES.

				£	s.	d.
To Sundry Creditors				33	3	5
„ Subscriptions paid in Advance				32	0	6
„ Life Membership Reserve Account				105	0	0
„ Kirkpatrick Endowment Fund				50	0	0
„ Balance at December 31, 1909	130	1	2			
Add Surplus for 1910	16	9	5			
				146	10	7
				£366	14	6

ASSETS.

				£	s.	d.
By 47 shares of £10 each fully paid in the M.G.S. Bldg. Co., Ltd., as under:—						
27 shares purchased	103	7	6			
20 shares presented	200	0	0			
				303	7	6
„ Subscriptions in arrear				22	6	3
„ Cash at Bank	37	10	3			
„ Cash in Hand	3	10	6			
				41	0	9
				£366	14	6

NOTE.—The Furniture, Fittings, Books, Maps, &c., Lanterns, Slides and Stock of Journals, which are insured for £1,000, are not included as Assets in the above Statement. There are 45 Life Members, and the subscriptions of 35 of this number have been taken as revenue in years prior to 1908.

I have audited the above Balance Sheet and certify the same to be correct. I have inspected the Certificates for the Shares in the Building Company.

THEODORE GREGORY (F.C.A.),
Honorary Auditor.

April 26th, 1911.

The Vice-Chancellor, in moving the adoption of the Report and Balance Sheet, referred to the service rendered by the Society in bringing the great explorers of the day to Manchester. There was an advantage in seeing these men which could not be got from reading their books.

He was glad that between the University and the Society there had always been a close association. The Society had helped the University by pressing the claims of Geography as a special study. If they wanted accurate thinking and vivid thinking, they must think geographically.

He was not sure that Manchester people realised how much the prosperity of the City depended on geographical knowledge, using the word in its widest sense. It was essential that their young people should not only know about their immediate surroundings, but that they should have accurate and full knowledge of other countries upon our relationship with which the prosperity of Lancashire depended.

In the interest therefore of both theoretical knowledge and of Lancashire business the Geographical Society ought to receive support. More members were needed, not merely because of their subscriptions but also in order that the sphere, work, and influence of the Society might be enlarged. They were not making an appeal on behalf of a charity, but were offering the advantages of a club and the means of obtaining valuable information.

Mr. Zimmern, F.R.G.S., in seconding the resolution, said that we flatter ourselves that we have proved Geography not to be a dry, dull, uninteresting study. Ten years ago Schools of Geography were struggling into existence at Oxford and Cambridge, it is satisfactory to note that these examples have been followed by every University in Great Britain. It was to be hoped that there would some day be established in this country a Geographical Department, as in Berlin, to enable travellers to go out at the expense of the State to increase our scientific knowledge as well as the commercial interest of the world generally.

If Manchester people, especially merchants, would only support the Society more freely we could do more useful work.

You have heard the report of our work, the list of lectures comprises the civilized and the uncivilized world, including great travellers and explorers, such as Peary and Stein, tourists, missionaries, officials entrusted with governing our outlying possessions, courageous ladies braving hardships unavoidable; the relation of their experiences increases our knowledge of the world in which we live.

The world is not yet entirely explored, there is plenty to do for Geographical knowledge in spite of the great achievements during the last few years of Sven Hedin, Stein, Shackleton, Peary, the Duke of Abruzzi, Dr. Charcot, and others.

There are still at work:—Bruce, Amundsen, Scott and Filchner, in the Polar regions; Longstaff, Bruce and others in the mountains of India and Central Asia; Goodfellow and Rawlins in New Guinea, and many others all over the world.

I will conclude with a sentence from Miss Qualtrough's lecture delivered last year on "The Fascination of Geography." She said:—

> "We live in a beautiful and interesting world, one marvellously fitted to supply our wants and to provide us with enjoyment, and it seems fitting that if we would be worthy denizens of such a home that we should know something of it, what it looks like, how large it is, what resources it contains, and what sort of lives are lived in it. To know these things is the main purpose of Geography—to have certain facts known because when learned, they have a value of their own. It is the study which brings the imagination into play in order that mental pictures of things wholly outside the range of one's own observation may be formed, and therefore it is full of natural attraction."

With your kind assistance we will continue to do our best in the next quarter of a century as we have done in the past twenty-five years.

The resolution that "the Annual Report and Balance Sheet be adopted" was passed unanimously.

Mr. Joel Wainwright, J.P., in moving that the best thanks of the meeting be given to the Officers and Council for their services referred to the senior Honorary Secretary's great services in lecturing, and especially in regard to the Cotton Growing question, which is such an important one for Lancashire.

Mr. A. Balmforth, in seconding the resolution, spoke in appreciative terms of the lectures, the majority of which he had the good fortune to hear, and also mentioned the splendid manner in which they were illustrated.

A copy of the list of retiring Officers and Council, who had been nominated, having been handed to each member present, Mr. W. Spencer moved, Mr. Sidney Smith seconded, and it was unanimously resolved that "the Officers and Council as nominated be elected." (See list with Title Page.)

Mr. David A. Little, in moving the following resolution, gave expression to the indebtedness of the Society to Mr. Gregory during the long period in which he had given honorary service :—

> "That the best thanks of the Society be given to Mr. Theodore Gregory, J.P., F.C.A., for his services as Honorary Auditor, and that he be re-elected."

Mr. T. W. Sowerbutts, F.S.A.A., seconded the resolution, which was passed unanimously.

Mr. F. Zimmern, F.R.G.S., moved, Mr. T. C. Middleton, J.P., seconded, and it was resolved that this meeting of members express sympathy with the President in his illness, and hope for his speedy recovery and complete restoration to health.

It was moved by Mr. J. Howard Reed, F.R.G.S., seconded by Mr. F. S. Oppenheim, M.A., and resolved

> "That the best thanks of this meeting be tendered to the Lord Mayor for the use of his parlour, and to the Vice-Chancellor of the University for his kindness in presiding over the meeting."

Proceedings of the Society.*

January 1st to June 30th, 1911.

The 870th Meeting of the Society was held on Saturday, January 7th, 1911, in the form of a party for the children of the members. The Victorians acted as hosts, and welcomed their guests at 5-30 p.m. The greater part of the evening was occupied by musical and other games, under the direction of the Victorians and their lady relatives, some of whom gave valuable assistance at the piano. Two lantern exhibitions of half an hour each at 6-15 p.m. and 8-30 p.m. and refreshments at 7-0 p.m. completed the programme.

After a very enjoyable evening the children sang "Auld Lang Syne," and separated after giving a round of hearty applause, thus thanking the Victorians and their friends.

The 871st Meeting of the Society was held on Tuesday, January 10th, 1911, at 7-30 p.m. Mr. F. Zimmern, F.R.G.S., presided.

The Minutes of the Meetings held on December 13th and 20th, 1910, and on January 7th, 1911, were taken as read.

The Chairman announced the election of Mr. Thomas Rumney as an Ordinary Member.

Mr. W. J. Pearce, of the Amateur Camping Club, gave a Lecture on "A Zig Zag Tour through Europe, with Cycle, Camp and Camera." The countries traversed were :—France, Switzerland, Germany, The Tyrol, Austria, Poland, Russia, and by steamer to Belgium. The Lecture was illustrated with almost 200 lantern views taken by Mr. Pearce during the journey.

On the proposition of the Chairman, a hearty vote of thanks was passed to Mr. Pearce for the very interesting and instructive account which he had given of his journey.

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* The Meetings are held in the Geographical Hall, unless otherwise stated.

The 872nd Meeting of the Society was held on Tuesday, January 17th, 1911, at 7-30 p.m. In the Chair, Mr. Charles A. Clarke.

The minutes of the Meeting held on January 10th were taken as read.

The election of the following Members was announced : Ordinary : Miss A. G. Shayler, Rev. S. A. Leathley, M.A., Messrs. C.V.M. Edleston, W. Young Martin, M.D., C. R. Raby, A. E. Thomson, G. H. Wingate, and Leonard Young. Associate : Miss Henrietta Young.

The Rev. Cowley Clarke, F.R.G.S., gave a lecture on " Constantinople, Old and New : Under the Old Regime and under the New." The lecture gave the results of visits in the Spring of 1891 and the Autumn of 1909, and was well illustrated with a large number of fine lantern views.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer for his very interesting address.

The 873rd Meeting of the Society was held on Tuesday, January 24th, 1911, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.

The minutes of the Meeting held on January 17th were taken as read.

Mrs. Louise Hirsch gave a Lecture on "A New Highway through Canada." The lecture was illustrated with many fine lantern views, and described the new Grand Trunk Pacific Railway, its gradient, scenery, and country opened up ; and also treated of Canadian Agriculture, gold-mining, fisheries and commerce, tepees and villages, Chinamen, Canadian Cities, buildings, customs, etc.

On the motion of the Chairman, it was unanimously resolved that the hearty thanks of the meeting be tendered to Mrs. Hirsch for the very interesting account which she had given of the proposed railway and its probable results, and for the excellent slides shown.

The 874th Meeting of the Society was held on Tuesday, January 31st, 1911, at 7-30 p.m. In the Chair, Mr. Charles A. Clarke.

The minutes of the Meeting held on January 24th were taken as read.

The election as Ordinary Members of Miss Henrietta Young (in lieu of Associate) and of Mr. Thomas Burke was announced.

The Chairman mentioned the loss which the Society had sustained by the death of an Honorary Member, the Rev. S. McFarlane, LL.D. After referring to the valuable assistance given to the Society by lecturing and in other ways by the deceased member, the Chairman moved that the sympathy of the members should be conveyed to the relatives of Dr. McFarlane in their sorrow. The resolution was passed by those present rising in silence.

Mr. S. Ashworth gave an account of "A Tour through the Bavarian Highlands and the Austrian Tyrol." The address was illustrated with lantern slides prepared by the Lecturer from the photographs which he took while on the journey. Mr. Ashworth was only able in the time at his disposal to describe the journey as far as Innsbruck, but he kindly promised to show the other half of his slides and finish the description of his tour on some evening in the Autumn.

On the motion of the Chairman, it was unanimously resolved that the best thanks of the meeting be tendered to Mr. Ashworth for the interesting account which he had given of his journey.

The 875th Meeting of the Society was held on Tuesday, February 7th, 1911, at 7-30 p.m. In the Chair, Mr. J. Howard Reed, F.R.G.S.

The Minutes of the Meeting held on January 31st were taken as read.

Dr. A. Wilmore, F.G.S., gave a Lecture on " Some Geographical Problems of the Mid-Pennines " (see page 33). The address was illustrated with lantern views

The Chairman moved and it was unanimously passed with applause that the thanks of the meeting be given to Dr. Wilmore for his interesting and instructive lecture.

The 876th Meeting of the Society was held on Tuesday, February 14th, 1911, at 7-30 p.m. Mr. F. Zimmern, F.R.G.S., in the Chair.

The minutes of the Meeting held on February 7th were taken as read.

The Chairman announced the election of the three following Ordinary Members :—Dr. R. H. Quine, Messrs. Thos. Hyde and G. Wihl.

Mr. Broome P. Smith, F.R.G.S., addressed the members on his

"Travels in Africa's Wonderland" (see page 39). The lecture was illustrated with a large number of the lecturer's own photographs.

On the motion of the Chairman a hearty vote of thanks was passed to the lecturer for the very interesting account which he had given of his journeys.

The 877th Meeting of the Society was held on Tuesday, February 21st, 1911, at 7-30 p.m. Mr. R. A. Staniforth presided.

The Minutes of the Meeting held on February 14th were taken as read.

Mr. F. Stevenson described "A Tramp through the Wilds of Connemara," and illustrated his address with a very fine collection of coloured and other slides.

The Chairman moved and it was unanimously resolved that the hearty thanks of those present be given to the lecturer for his interesting address and for the slides shown.

The 878th Meeting of the Society was held on Tuesday, February 28th, 1911, at 7-30 p.m. Mr. R. Cobden Phillips, in the Chair.

The minutes of the Meeting held on February 21st were taken as read.

The Chairman announced the election of three Ordinary Members, viz.:—Miss E. I. Sales, Messrs. Ivan Levinstein and Fred Nathan.

Mr. John McFarlane, M.A., M.Com., F.R.G.S., gave a Lecture on "The Falls of Niagara." He first dealt with their past history, mainly from a physical point of view, then described their present condition, and finally discussed their probable future, taking into special consideration the effect of the abstraction of water for the power stations. The address was illustrated with a fine collection of maps, diagrams and views.

On the motion of the Chairman a hearty vote of thanks was passed to the lecturer for the very interesting and instructive account which he had given of the Falls.

The 879th Meeting of the Society was held on Tuesday, March 7th, 1911, at 7-30 p.m. Mr. R. Cobden Phillips presided.

Mr. C. H. Bellamy, F.R.G.S., of Tourcoing, France, gave a Lecture on "Andalusia, the Home of the Moors." The address was illustrated with a large number of fine lantern views, mainly from photographs taken by the lecturer on his journey.

The lecturer detailed the circumstances which led up to the conquest of Spain by the Moors, and the beneficent effects which followed it, for whatever makes a country great and prosperous, whatever tends to refinement and civilization was found in Moslem Spain The visit to Andalusia was prefaced by a run through Catalonia, views being given of Barcelona, its Cathedral, Churches and Streets; Tarragona Cathedral and the cyclopean walls and houses of the town. Valencia was then visited with the striking Miguelete Tower, the Cathedral and the beautiful Gothic Exchange. Notice was taken of the way in which the shops are without fronts. Then Granada was visited, a detailed description being given of the world-famed Alhambra, its Court of the Lions, Court of Myrtles, Hall of the Ambassadors, and its myriad beauties. Malaga, Ronda, Algeciras and Gibraltar were then visited. A steamer was taken from the latter place to "Fair Cadiz, rising o'er the dark blue sea." A detailed account was given of Seville, with its wonderful Cathedral and the famous Giralda Tower, the Palace of Santelmo, the Town Hall, the House of Pilate, and the famous Alcazar, which contrasts very unfavourably, for all its brilliancy of colouring, with the simplicity of the Grenadine Palace. In Seville one wanders through streets which are redolent of Arabia, and peeps into countless Oriental patios, cool with fountains, and shaded by palms and Eastern canopies, and one recognizes the truth that inspired the old Spanish saying "To whom God loves, He gives a house in Seville." The last town described was Cordova, which the lecturer considered was worth the trouble of the journey, even if he had not been able to visit any other town, in Andalusia. Of course the great sight here is the magnificent Mosque, in which there still remain 850 columns of marble, porphyry, jasper, and breccia. The Mosque of Cordova is still to-day, by universal consent, the most beautiful Moslem temple, and one of the most wonderful architectural monuments of the world, defaced as it has been by the introduction of a Christian Cathedral, which has for ever destroyed its harmonious proportions.

On the motion of the Chairman, a hearty vote of thanks was passed to Mr. Bellamy for his intensely interesting address and for the photographs with which it was so well and clearly illustrated.

The 880th Meeting of the Society was held on Tuesday, March 14th, 1911, at 7-30 p.m. Mr. F. Zimmern, F.R.G.S., in the Chair.

The minutes of the meeting held on March 7th were taken as read.

The election of Mr. F. Champ as an Ordinary Member was announced.

Prof. Sir Thomas H. Holland, K.C.I.E., D.Sc., F.R.S., A.R.C.Sc., gave a lecture on " The Systematic Study of a Great Earthquake." The lecturer dealt more particularly with the Great Kangra Earthquake of April 4th, 1905, and illustrated his lecture with many lantern slides of maps, diagrams, and views, illustrating the effect of the earthquake.

On the motion of the Chairman a hearty vote of thanks was passed to the lecturer for his interesting account of the Kangra Earthquake, and of the modern methods of studying similar phenomena.

The 881st Meeting of the Society was held on Tuesday, March 21st, 1911, at 7-30 p.m. In the Chair, Mr. R. Cobden Phillips.

The Minutes of the Meeting held on March 14th were taken as read.

Miss L. Edna Walter, B.Sc., H.M.I., gave a Lecture on " The Fascination of Brittany." The address was illustrated with lantern views prepared from the lecturer's own photographs.

The Chairman mentioned that Miss Walter had prepared a small book on " Brittany " which would shortly be published, and asked those present to pass a vote of thanks to the lecturer for the very interesting description which she had given of Brittany and its people, illustrated with such beautiful slides. The resolution was carried unanimously.

The 882nd Meeting of the Society was held on Tuesday, March 28th 1911, at 7-30 p.m. Mr. F. Zimmern, F.R.G.S., presided.

The Minutes of the Meeting held on March 21st were taken as read.

Mr. Richard Kalisch, F.R.G.S., described some " Winter Tours in Japan," illustrated with a large number of excellent lantern slides prepared from photographs taken by the lecturer.

On the motion of the Chairman, a cordial vote of thanks was passed to Mr. Kalisch for his very interesting address so well illustrated.

The 883rd Meeting of the Society was held on Tuesday, April 10th, 1911, at 7.30 p.m. In the Chair, Mr. David A. Little.

The minutes of the Meeting held on March 28th were taken as read.

Miss Agnes Deans Cameron (author of "The New North") gave a Lecture on her journeys in "Unknown British Columbia," and illustrated her address with a large number of lantern slides from her own photographs.

The Chairman moved and it was passed unanimously with acclamation that the hearty thanks of those present be given to Miss Cameron for her very interesting and instructive lecture so well illustrated.

The Journal

OF THE

Manchester Geographical Society.

* * *

MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, PORTSMOUTH, 1911.

(Wednesday, August 31st to Wednesday, September 6th.)

By J. Howard Reed, F.R.G.S.

(Report of the Delegate given at the Meeting held on February 13th, 1912.)

No more fitting centre for a meeting of the British Association than Portsmouth could be chosen, viewing the matter merely from the point of view of the pleasure and comfort of the visiting members and delegates.

Though the meeting was small it was very successful. A vast amount of useful work was got through, though nothing of an epoch-making nature can perhaps be recorded.

The work of Section E (Geography) was in the opinion of the writer much below the average in value, and indeed would have been extremely tame and uninteresting had it not been for the address by Captain C. G. Rawling, on British Exploration in Dutch New Guinea, and for the joint meetings with Sections C and K.

The business of the Section opened with the address of the President, Lieut.-Colonel C. F. Close, C.M.G., R.E. This was received with every respect and attention, but with mixed feelings on the part of the Geographers present. (The Address and the Delegate's remarks thereon follow this Report.)

The paper which immediately followed the Presidential Address was one on *Thermal Maps*, by our old friend Professor Herbertson. This was illustrated by diagrams and proved both useful and suggestive, though, as the author admitted, by no means exhaustive.

Mr. A. R. Hinks followed with a paper on *Colour Represen-*

tation of Hill Features, which was also well illustrated and excited considerable interest.

Captain E. O. Henrici, R.E., discoursed on *Mean Sea-level.*

The same author read a second paper dealing with *The Height of Ruwenzori.* It was mentioned, he said, in the report of the Committee on the Geodetic Arc in Africa, presented last year at Sheffield, that observations were taken by Captain Jack, R.E., to determine the height of Ruwenzori. The computations were not completed by the time Captain Jack had to leave England, and the data were left in the author's hands.

The initial mark, with reference to which the heights were determined, was the station peg at Lake Albert Station. The heights of all the stations observed in the arc triangulation were computed, and the probable errors of the results rigidly determined. The final result of these observations and computations showed that the highest point of Ruwenzori is 16,801 feet, with a possible error of a little over 5 feet.

On the Friday morning a joint meeting with Section C was held at the meeting-place of Section E, and was largely attended by both Geologists and Geographers. The subject under discussion was: *The former connection of the Isle of Wight with the Mainland*, and was very ably introduced by Mr. Clement Reid, F.R.S. This paper may be briefly summarised as follows: The accepted hypothesis to-day is that the Solent is a submerged river-valley which has been cut into by the sea and its geographical conditions thus altered. Some difference of opinion exists as to whether the ancient river flowed from the west or the east, but Mr. Reid believes that it flowed from the west, and was indeed one of England's largest rivers, comparable both in extent and geologically with the Thames. The character of the stones found in the gravel deposits on both sides of the Solent shows that their place of origin was almost certainly the west country. Earth movements, and later the action of the sea, caused such alterations in the drainage area, and in the direction and extent of the streams, that the Solent ceased to exist as a river, and in due course the sea encroached to such an extent that the old bed of the Solent became an arm of the sea, and the land area we know as the Isle of Wight became isolated from the mainland. The discussion of this subject gave an opportunity for several interesting and instructive speeches.

A useful paper on *Constructive Waterfalls* was read by Professor J. W. Gregory, F.R.S.

Waterfalls, he said, are among the most effective agents in deepening river valleys, and thus lowering the land. Their influence is usually regarded as solely destructive; but they may, under some conditions, be constructive and act as agents of deposition instead of denudation. This action is well illustrated by some waterfalls in Dalmatia, Bosnia, and Herzegovina.

The Kerka Falls in Dalmatia, ten miles from Sebenico, illustrate a simple type of constructive waterfall. They are due to a barrier of calcareous tufa, which the Kerka River has built up across its valley. The barrier is 130 feet high; the river is subdivided into many channels, and each falls in a succession of cascades over the tufa terraces. Above the barrier is a plain of alluvium, and a short distance up stream the river flows from two lakes, one of which is eight and a half miles long. The lakes have been formed by the tufa dam, and as this barrier is being raised in height with its advance downstream, the lakes are being increased in size owing to the action of the waterfall.

The Topolie Falls on the Upper Kerka River afford a clear illustration of the construction of a tufa dam by a waterfall. The fall is about 70 feet in height, over a tufa barrier which is being deposited by the waterfall. The barrier is advancing downstream, and the old gorge of the Kerka River, or as it is there called, the Kerkic River, is accordingly being filled with alluvium. When the falls have advanced another 500 yards, the river will leap from a hanging valley on to the floor of the Knin Basin.

The famous falls at Jajce, the ancient capital of Bosnia, are due to the leap of the Pliva River, from a hanging valley over a tufa sheet, 80 feet thick, into the Urbas River. Some Neolithic remains show that about 60 feet of the tufa has been deposited at Jajce during and since Neolithic times. The Pliva River has cut a notch through the old sheet of tufa which it had previously deposited, owing to an increase in the gradient of the river caused by other tufa bars erected further up its valley.

These three waterfalls show that the ordinary waterfall action may be reversed; waterfalls may advance instead of retreat, may fill up valleys instead of excavating them, may form alluvial plains instead of destroying them, and may make lakes basins instead of draining them. Waterfalls may also form hanging valleys.

The paper on *Tidal Movements in the Deep Water of the Skagerrak and their Influence upon the Herring Fishery*, read by Professor O. Pettersson, was of an instructive character.

The most prominent feature (he stated) in the hydrographic state of the eastern side of the North Sea, and its tributaries, the Baltic, the Kattegat, the Skagerrak, and the Scandinavian fiords, is the stratification of the waters in layers of different origin discernible by difference in their temperature and salinity. The boundary surface between two adjacent water layers can, as a rule, be located with considerable accuracy, and by means of a registering apparatus changes in the level of the deep water (as distinguished from the surface water) can be ascertained. A study of these changes conveys the idea of a train of big submarine or boundary waves. This wave movement seems to have its origin in the deep water, as the surface water enters or is expelled from the fiord, whenever there is a subsidence or upheaval of the deep water. There are small boundary waves of two to three days' periods, which are evidently seiches of the deep water inside the fiord, since they do not correspond to analogous movements of the deep water of the Skagerrak outside the fiord, and there are great boundary waves of thirteen to fourteen days' period, which are not confined to the fiord, but are in most cases felt on the other side of the Skagerrak. The great boundary waves seem to correspond in their period with the changes in the position relatively to the earth of the sun and the moon; (*a*) the regular train of such waves begins with the autumnal equinox and ends in the following April, the biggest waves thus occurring when the earth is in perihelion; (*b*) the phases of the moon, but still more, its declination and distance from the earth, seem to have influence upon the occurrence of the big waves.

It seems obvious that the motions of the deep water are of a tidal nature, but it seems possible that they belong to the special classes of such phenomena called tidal seiches, *i.e.*, movements of the waters of a limited basin caused by the passages of the oceanic tidal waves over its threshold. To investigate this theory, tank experiments were conducted, from which it would appear that the original tidal wave, whether it be forced or free, is modified by its impact upon every submarine ridge it encounters, and gives birth to tidal phenomena of various kinds which can, however, always be recognised by their periodicity.

The occurrence of big boundary waves seems to exercise an influence upon the arrival of the herring shoals on the coasts of Sweden in autumn and winter. It is well known that the fish life of the ocean has its highest frequency where the movement of the waters is most intense. Investigations show that since 1753 the herring fishing has been most prolific in years of maximum declination of the moon and least prolific in years of minimum declination. A high declination causes a more energetic movement of the waters of the innermost parts of the North Sea and its inlets. In summer the herring shoals are spread over the whole northern plateau of the North Sea, and in winter are found concentrated in the eastern and southern parts. The chief agent is the sun's declination (and the earth's perihelion), which causes the yearly period. The influence of the moon, on the other hand, upon the movement of the deep water causes the periods of abundant and scarce fishing every eighteenth or nineteenth year.

On the Monday morning the second of the joint meetings was held. This was composed of the adherents of Sections E and K (Geography and Botany), was well attended and proved of considerable interest. The subject chosen for discussion was: *The Relation of the Present Plant Population of the British Isles to the Glacial Period.* The discussion was opened by Mr. Clement Reid, F.R.S., whose paper was of equal interest with that which he delivered at the earlier joint meeting, to which reference has already been made. Mr. Reid said:—

> The distribution of our British plants has long been a puzzle to the botanist, and no explanation was forthcoming till the cause was searched for in bygone changes of climate, and changes in the distribution of land and sea. A century ago it was generally supposed that species had originated mainly in the districts in which they were then found. But even under this hypothesis the anomalies of discontinuous areas seemed to require explanation, for the same species was not likely to originate at several different points.
>
> With the growth of the idea of gradual evolution it was realised that faunas and floras had a past history, even if the included species had remained unchanged. Botanists recognised that there were many points that required explanation. For instance, it was noticed at an early date that each of our mountain-tops possessed a small outlying fragment of Arctic flora. How came it that the same species occupied so many different mountains? This seemed a perfectly fair subject of inquiry, even to naturalists who hated the very idea of evolution when applied to species and genera.
>
> More than sixty years ago a great impetus was given to this study by the discovery that Europe had passed through a most remarkable series of climatic changes, and that, too, during the lifetime of the existing species of animals and plants. There had not been a mere cooling of the climate; the temperature in these latitudes had sunk far below its present level, and then had again risen.
>
> Edward Forbes, in 1846, seized this clue, and explained through it, as relics of the Glacial Period, the Arctic plants stranded on our mountain-tops; they were plants left behind when the climate became too warm for them any longer to survive on the plains. The subsequent discovery of fossil remains of these plants scattered over the plains, and often associated with relics of Arctic animals now extinct in Britain, seemed a brilliant proof of Forbes' view, which has been generally adopted.
>
> In some curious way, however, botanists and zoologists both seem to have overlooked the difficulty that, granting Forbes' hypothesis to be sufficient to account for our alpine flora, it rendered more difficult instead of easier the explanation of our

southern flora, which occurs in a similar way stranded in some of the warmest low-lying parts of Britain.

We meet to-day to discuss this question, in the hope that botanists, zoologists, and geologists may realise each other's difficulties, and may be able in combination to give a clear teaching on this important problem of geographical distribution.

The discussion I have been asked to open is limited to the relation of the present Plant Population of the British Isles to the Glacial Period. Our problem is a special one; it is not the same as that which confronts the botanist on the Continent of Europe or America; and it is not the problem of the origin of the flora of an oceanic island. Also, the wider question of the origin of the species composing the British flora is outside the discussion, for it would lead us into too many untrodden bypaths, and could not satisfactorily be gone into in the present imperfect state of our knowledge.

Perhaps it will be well to explain at once why the inquiry is thus limited to comparatively recent periods, and how it is that we need not explore the unknown earlier periods and deal with larger questions.

Our first inquiry in this case must be: Has there been any continuous occupation of Britain by a temperate flora and fauna from pre-Glacial times to the present day? Or, to put it in other words: Are any of our plants survivors that managed to live through the cold of the Glacial period in some warm nook in Britain? They evidently found a refuge somewhere, for we know that the same temperate species that live in Britain now were here in pre-Glacial times. But was this refuge in Britain?

Here geology comes to our aid, and I think that all geologists who have made a special study of the climatic conditions will agree with me. Any survival of our flowering plants, except in the case of a few Arctic and Alpine species, was quite impossible.

It may come as a shock to some of my colleagues when I say that for this particular discussion we have a perfectly definite starting-point. We have merely to account for the incoming of our existing flora, after an earlier assemblage had been swept away almost as completely and effectually as the celebrated volcanic eruption wiped out the plants of Krakatoa.

I propose now to say a few words as to the bygone climatic and orographic changes, and on their bearing on the existing flora of Britain.

We know that during the greatest intensity of the cold all Scotland, Ireland, and the greater part of England were buried under ice and snow—except, possibly, for some high peaks on which a few Arctic species survived. Ice filled the North Sea and covered the lowlands of England down to the mouth of the Thames. Without crossing the Thames it almost reached London. Its southern limit stretched to South Wales, where tongues of ice reached the Bristol Channel in big glaciers like those of the

Antarctic regions or Greenland. In South Wales a few hills may have escaped, though surrounded by ice.

The glaciation in Ireland was even more extreme, for apparently no part of Ireland escaped. Even the warmest parts of the south-west are striated and covered by morainic material, the ice extending well out into the Atlantic. The icebergs were so big, or the ice-foot so thick, that, breaking away from the Irish coast, the masses were able to float across to the Scilly Isles before they melted; for they carried with them numerous striated stones of well-known rocks, now found stranded on the highest parts of the Isles of Scilly. Thus it is evident that in those days Scilly, our most southerly and warmest point, was surrounded by a bitterly cold ocean, and it was submerged to such an extent that it could be overridden by pack-ice. Could any temperate plant survive such treatment? I particularly want you to realise the climate that Scilly enjoyed in those days, for it is now one of the warmest spots in our islands, and its temperate flora has come back, though the islands are surrounded by fairly deep sea.

It seems evident, therefore, that a temperate flora could not have survived the cold in Ireland or in the Scilly Isles. But there is still the non-glaciated area south of the Severn and Thames to consider, and botanists may tell us that the temperate flora survived in some warm nooks in Devon or the Isle of Wight. Here, however, we can point to evidence that the botanist himself must accept as conclusive.

In the south of Devon one of the warmest of the sheltered valleys is that through which the Teign flows to Newton Abbot. But in the alluvial deposits of this valley, and only a few feet above the sea-level, Professor Oswald Heer and Professor Nathorst discovered leaves of the dwarf Arctic birch and some Arctic mosses.

Time will not allow us to go into all the evidence; so I will only point to one or two other areas which prove the extreme rigour of the climate in the South of England. Close to Salisbury are found in profusion remains of various Arctic animals—reindeer, musk-ox, Arctic fox, lemming, and several others. Unfortunately plants do not seem to have been searched for, and the sections were obscured when I visited the pit; however, the flora associated with this assemblage of mammals can only have been the flora of the Arctic regions.

To come nearer home, around Portsmouth itself we have abundant evidence of this icy sea, for in the peninsula of Selsey especially we find numerous large erratic blocks floated by ice. Some of them have been identified as coming from the Isle of Wight, others from Bognor and Cornwall, and a number came from the Channel Islands. Thus even the north coast of France had its shores fringed with ice.

Is it possible to believe that the plants of the south of England, many of which can barely hold their own during a severe winter nowadays, could have survived these Arctic conditions, when Spithead was thus blocked with ice-floes?

If the southern plants were completely swept away by the cold, the question arises: How did they come back again, especially to islands like Ireland and the Isles of Scilly, and how did they obtain their very singular present geographical distribution? We are told that the matter is simple enough, for Britain has often been connected with the Continent, and the plants spread slowly overland. However, before we adopt the view that for animals and plants to spread to islands it is needful to have land-connection, you should remember Krakatoa, and the rapidity with which the exterminated flora has come back. Also I must point out that there are peculiarities in the distribution of the different elements that go to make up the existing British flora that no land-connection will explain. Look at the recent distribution. One of the most striking peculiarities is the Pyrenean element in our flora. It is practically confined to two areas, the one in Cornwall and the other in the West of Ireland. Geologists nowadays will not agree to the reconstruction of a lost Atlantis to account for this peculiar distribution.

Undoubtedly since the Glacial period our islands have seen several oscillations of level. There has also been widening and narrowing of straits and channels. England has been connected with France near Dover, and also across the North Sea with Holland and Denmark. But 20 or 25 metres seems to have been the approximate extent of the rise in the south of England. I have searched in vain for evidence of a greater movement. A shallowing of the sea by 25 metres is not nearly sufficient to connect Ireland with England or Scotland, or the Isles of Scilly with England. Still less would it suffice to connect the West of Ireland or Cornwall with the Pyrenees, where the peculiar plants find their home. A rise of land to this amount would not even bring Scilly and the Land's End appreciably nearer together.

This limitation of the extent to which we can bridge over the gaps between our islands is, however, a point on which there is much difference of opinion, and I will not insist on the conclusiveness of the evidence as to the extent of the oscillations.

From the botanist's point of view there are, however, other archipelagos besides those surrounded by water. No doubt if we can postulate sufficient orographic changes plants would spread slowly from land to land during the few thousand years that have elapsed since the cold died away. But—and this 'but' is all-important—they would only do so if the soils were suitable. An isolated tract of limestone surrounded by clay or by sand is as much an island, as far as many of our most peculiar plants are concerned, as if it were surrounded by water. We have many such islands—or oases is perhaps a more suitable term for them—and no possible ups and downs of the land will connect them. Many of them, like the central limestone district of Ireland, or the

Peak District in Derbyshire, or the West Yorkshire carboniferous limestone, must have been isolated from far-distant geological periods, from times before the present flora of Britain had any existence. We have a still more difficult problem than this. Britain is divided into numerous river-basins, for most of which any connection with other basins in post-Glacial times is unthinkable. Yet each basin yields numerous aquatic plants and animals of the same species as those found in other basins cut off by high hills. Isolated lakes have their aquatic flora; and even artificial ponds, such as the dew-ponds of our high chalk downs, have a fauna and flora closely proportionate in the number of species with the time that has elapsed since the pond was made, or since it last dried up. If no actual connection between river-basins or isolated ponds is needed for the spread of aquatic plants, why need we postulate a land-connection for the land-plants, or a bridge of limestone to aid the migration of the limestone plants from crag to distant crag? Aquatic plants and limestone plants must obviously in most cases have taken leaps of many miles to arrive at their present stations. Our plants have far greater power of crossing deserts and seas than most botanists are willing to allow.

Let us examine the present distribution of one of the most interesting groups of British plants. The Atlantic or Lusitanian plants form an assemblage belonging mainly to the Pyrenees, and found also in the S.W. of England, and again in S.W. Ireland. But they do not occur in the intermediate districts. If we look more closely into the composition of this Atlantic flora, as it is represented in Britain, we find that only plants with small seeds have been able to cross to Cornwall and Ireland, those with large seeds being left behind on the Continent. There is only one tree among them, and that is the *Arbutus,* one of the few trees with minute seeds now living in Europe. A further examination confronts us with the puzzle that, whilst various Pyrenean species are found also in Cornwall and Kerry, the species occurring in Cornwall and Ireland are not the same. The *Arbutus* is a case in point; it is wild in Ireland, but in no part of England. *Erica ciliaris* and *E. vagans* are English, and not Irish; *E. mediterranea* is Irish, and not English.

The local distribution of these plants is equally strange. A few, like *Pinguicula lusitanica,* have spread throughout the west country, wherever the conditions are suitable. Most occur, however, in quite different fashion; they are abundant over certain limited areas, to which they are strictly confined, but they are absent from other adjoining areas, though equally suited. I have mapped and examined a good many of these areas, and the plants seem in most places to be spreading vigorously from certain definite centres, to which chance has transported a seed. Thus, *Erica ciliaris* is confined to two areas, one in Cornwall, the other in Dorset. *E. vagans* occurs abundantly in the Lizard and again on quite different soil in North Cornwall, so that the serpentine soil has nothing to do with its present distribution.

Chance introductions of seeds during thousands of years explain the existing peculiarities of geographical distribution in a way that no changes of sea or land or climate will do. Our Alpine flora consists largely of survivors from a colder period; the rest of our flora, on the other hand, is constantly being added to by chance introductions from the nearest continental shore. That is why the Atlantic element, and the eastern element, though not consisting to any great extent of maritime plants, are confined mainly in Britain to areas within a few miles of the coast. Seeds are evidently brought from the Continent and scattered broadcast over certain coastal districts, and they grow and spread where soil and climate are suitable. But the post-Glacial period has been so short that the process is still incomplete, and the slow spreading inland has only as yet extended a few miles. We can still fix the point or points of introduction.

The most striking elements in the British flora, except the Arctic and Alpine species, have a marked coastal distribution. The plants found correspond with those of the land opposite (in which they are often inland, as well as coastal). Thus the Cornish plants and those of S.W. Ireland contain a large Pyrenean element; Norfolk plants correspond with those of the opposite shore of the North Sea; even two or three American plants are found on the coasts facing America.

All the evidence seems, therefore, to point to a steady change and increase in our flora, due to occasional introductions. These introductions are, I think, now mainly due to birds driven by exceptional gales. But herds of migrating bison, deer, and horse have played their part, especially when the Straits of Dover were much narrower or non-existent. Packs of wolves which hunted the large game, foxes, cats, and especially raptorial birds which waited for and struck down the tired migrants, must also have assisted. Fences and the destruction of wild animals have probably rendered the process far slower than formerly; but it still goes on, as anyone can see who notes the constant occurrence of seedling oaks miles from the nearest tree.

If I am right, therefore, there is no such thing as a native plant in Britain. Our flora has been swept away like that of Krakatoa; but we have arrived at a much later stage of the re-peopling in our islands. It seems to me far more interesting to watch this process of introduction, change, and spreading than to enter into speculations as to what species shall be listed as "natives," "denizens," or "colonists." No such differences exist; it is all a question of degree.

Britain for several thousand years has been receiving colonists from all sources, and the process still goes on. The oldest element in our flora, the Alpine, occurs on nearly all our mountains; for it once occupied the intervening areas, and it does not greatly depend on conditions of soil. The limestone, aquatic, and Lusitanian floras, on the other hand, are more recent introductions; they can never have occupied continuous areas, and their present distribution is full of singular anomalies. These three elements of our flora are steadily growing in importance, whilst the Alpine element is stationary, or tends to die out.

The address by Captain C. G. Rawling, C.I.E., on *British Exploration in Dutch New Guinea*, was perhaps the most enthralling address of the meeting, so far as Section E was concerned. The object of the expedition, organised by the Ornithologists' Union, assisted by the Royal Geographical Society, was, Captain Rawling said, to survey the south-western part of Dutch New Guinea, and to study the flora and fauna of the districts. The expedition was led at first by Mr. W. Goodfellow, who acted as ornithologist, and after his departure by Captain Rawling. A landing was effected near the mouth of the Mimika river, where a base camp was formed. The party then advanced along the Mimika to Parimau—thirty miles in a direct line from the coast—where a base was established. The whole of the intervening country was covered with a dense growth of *Pandanus*, *Artocarpus*, *Ficus*, *Rattans*, and other plants. From Parimau attempts were made to penetrate into the mountains, but at first with little success. The Mimika proved useless as a means of advance, and the expedition was forced eastwards across and along the great rivers Kamura, Wataikwa, and Iwaka. A branch of the Wania was then followed for some distance, after which the exploring party made for the foothills, eventually reaching an elevation of 6,000 feet. Here a magnificent view was obtained. To the south lay the densely forested plains and foothills, while to the north was the Nassau Range with its steep precipitous front, which is over eighty miles in length, and varies from 8,000 to 10,500 feet in sheer height.

Among other results of the expedition large and valuable collections of birds and animals were made, together with botanical and ethnographical specimens. A new and unknown race of pigmies was discovered and studied; over 3,000 square miles of country were surveyed and mapped; and the impossibility of the Mimika, and the value of the rivers further east, as a line of advance to the snows was ascertained.

Captain Rawling's address was illustrated with a fine set of lantern slides, and by a number of most realistic cinematograph films.

Tuesday morning was mostly given up to the consideration of Aeronautical matters. M. Ch. Lallemand read a paper on *International Air-Maps and Aeronautical Marks.*

> In this paper the author described the resolutions adopted, at his suggestion, by the Permanent Committee for Aerial Navigation of the Public Works Department of the French Government on the subject of the production of an International Air-Map and the establishment of marks required by aviators and aeronauts. The map, designed on the scale of 1 to 200,000, after a provisional model submitted by the Aero Club, will be a subdivision of the "International Map of the World," on the scale of 1 to 1,000,000, for the production of which a common agreement was recently arrived at between the principal states of the civilised world. Each sheet of the air-map will cover an area of 1° in longitude by 1° in latitude. Twenty-four sheets of the same map will cover the same area as one of the sheets of the international map on the scale of 1 to 1,000,000, since each of the latter covers 6° in longitude by 4° in latitude. In order to avoid the troublesome distinction between eastern and western longitudes, northern and southern latitudes, with the inevitable errors caused by the change of sign, the longitudes are to be reckoned from 0° to 360°, in an easterly direction, commencing from longitude 180° E. or W. of Greenwich. In addition, there will be given, instead of latitudes, *polar distances,* reckoned from 0° to 180°, extending from the South Pole, in order that, in the northern hemisphere, where lie most of the inhabited lands, the numbers may increase in the customary way with increasing distance from the equator. Each sheet will be numbered by the co-ordinates of its South-Western corner. In addition, marks each of which is the distinguishing figure of half a rectangle, with the small sides duly set towards North, should be drawn on the roofs of convenient buildings or on the ground itself. Each of these marks indicates the northern or southern half respectively of the corresponding sheet of the aeronautical map. On each mark a large dot will indicate the proper position occupied on the sheet itself by the mark on the ground. Moreover, two large figures will be marked on each side of the rectangle, set towards North; the left one of which showing the number of the units of degrees of the longitude. A mistake of 10°, say 400 miles in the direction of the parallels, or 700 miles in that of the meridians, being scarcely probable, these two figures will suffice to define the number of the corresponding sheet of the map and the rough co-ordinates of the mark.
>
> If the example thus given by France should be followed by other countries, an international agreement would be necessary to fix positively the conventional signs of the aeronautical map and other particulars.

Considerable discussion followed the reading of this paper, in which Captain H. C. Lyons, F.R.S., took a prominent part, devoting himself particularly to Aeronautical maps.

Your delegate had the honour of reading a paper on *India, with respect to the World's Cotton Supply,* before Section F (Economic Science), which possibly would have been more suited to Section E. The printed abstract of the paper distributed at Portsmouth reads as follows:—

> Shortage of raw cotton has become an almost chronic condition with which the cotton manufacturer has to contend. It has produced abnormally inflated prices, given an opportunity to cotton gamblers, caused loss and embarrassment to manufacturers, and produced distress among cotton operatives. "Shortage" has not been produced by a falling off of the world's output of raw fibre, nor by an increased demand by Lancashire for cotton, but by an enormous growth in the manufacture of cotton goods on the Continent of Europe and in the United States of America. In eighteen years prior to 1910 Britain's demand for raw cotton has fallen 4 per cent., while during the same period Europe's requirements have increased 70 per cent., and this on a figure much larger than ours. America, during the same time, has increased her demand 90 per cent., and her total consumption of fibre now exceeds that of Britain by no less than 54 per cent. Thirty years ago the total American crop of cotton was less than seven million bales, but, supplemented by the small crops of other countries, was sufficient to supply the world's demands and leave a surplus each season, keeping the price reasonable and fairly regular. Now, with an American crop nearly double the figure just quoted, and with increased supplies from other fields, and with the demand of Lancashire stationary, the price of raw fibre has doubled, and "shortage" has become rampant, notwithstanding the restricted time worked in the mills. The difficulty apparently gets worse month by month, and unless measures of amelioration are successfully pressed, the cotton industry of Lancashire must decline, and ultimately be starved out of existence. India at present produces almost half the weight of cotton grown in the American fields, and has roughly 20,000,000 acres under cotton crops. Indian fibre is, however, of short staple and, therefore, very little used in Lancashire. Britain consumed only 87,592 bales during the year ending August 31, 1910. Many experts believe that with properly directed effort the crop of Indian cotton may be doubled in the course of a few years. If this can be done, even if the staple is not improved, it will take the place of much long-fibred cotton now used throughout the world, and set free for Lancashire a proportionate amount of better material. The cultivation of cotton in India is very primitive. The lands are poorly tilled, inadequately manured and meagrely watered; while the native farmer is not only very

unprogressive, but is harried by unscrupulous money-lenders, crippled by poor seed, and handicapped by insect pests. With selected seed longer-stapled cotton can be grown, but the native ryot finds it gives a lighter crop, and as he can under present conditions only obtain the same price as for the shorter-stapled cotton, he naturally soon reverts to the cultivation of short-stapled fibre. This is largely an economic difficulty, which can be met by the establishment of recognised buying and ginning centres, and the founding of Co-operative Credit Banks, each under scientific and official control. The Agricultural Department of India has done much to improve matters, but larger grants are required to enable it to do more. There is enormous scope for its usefulness. The native people need to be taught better methods of farming, modern agricultural machinery should be introduced, proper rotation of crops insisted upon, ample manuring provided for, better seed made available, honest methods of financing established, and well-placed and easily accessible ginning and buying centres set up. If work of this kind is taken in hand in a thoroughly efficient manner, more acres can be brought under cultivation, and the number of cotton cultivators will multiply. The development of railways, roads, and irrigation works, already in a highly organised condition, will advance as the demand for them grows. India has in the past produced better cotton, and can do so again under properly regulated conditions. Any efforts which can bring this about are well worth making, as their success means vast advantage to the agriculturists of India, a relief from the present serious strain in the cotton world, and the salvation of the great industry of Lancashire.

An interesting discussion followed the reading of this paper in which several gentlemen familiar with the cotton trade of Lancashire and the cotton fields of India took part.

The Conference of Delegates of the Corresponding Societies met twice during the Portsmouth meeting as on previous occasions. The meetings were fixed for 2 o'clock on the afternoons of Thursday and Tuesday, and were held in the Connaught Drill Hall. Probably mainly owing to the awkward hour these meetings were only sparsely attended. It is much to be regretted that something better as to the time of these gatherings cannot be arranged.

The following subjects among others were discussed at the Conference: *The Protection of Plants*, introduced by Mr. M. W. Webb. *The Distribution of Fungi*, by Mr. Harold Wager. *The Formation of a Definite System in which Collectors should record their Captures*, by Mr. F. Balfour Browne. These discussions were of much interest to naturalists, but do not particularly appeal to the members of this society.

In conclusion, it may be said that the British Association Meeting at Portsmouth, though small in numbers, and unexciting so far as new scientific revelations were concerned, was a great success. The weather was perfect, the local arrangements, so far as one could observe, were all that could be desired, and all the local setting was most pleasing. There was a general spirit of energy and gaiety abroad during the whole week, and all the members seemed to be generally pleased.

THE PURPOSE AND POSITION OF GEOGRAPHY.

By Colonel C. F. Close, C.M.G., R.E., F.R.G.S.

(The Presidential Address delivered to Section E (Geography) at the Portsmouth Meeting of the British Association, and taken as read at the Meeting of the Society held in the Geographical Hall on February 13th, 1912.)

I propose to devote the first part of this address to an examination of the purpose and position of Geography, with special reference to its relations with other subjects. It will not be possible entirely to avoid controversial matters; but, if some of the questions touched on are controversial, this only means that these questions have a certain importance. I shall try to describe the facts of the case impartially.

In the second part I shall try to indicate briefly what the Government, as represented by the great Departments of State, is doing for Geography.

Part I. *The Position of Geography with reference to other subjects.*

It is no secret that the geographical world is not unanimous about the meaning and object of Geography. The definitions suggested by such writers as Mr. Chisholm, Professor Davis, Professor Herbertson, Mr. Mackinder, or Dr. Mill, are not in agreement. From time to time an attempt is made to formulate some statement which shall not commit the subscribers to anything very definite. But differences of opinion on the subject persist.

There are, of course, a great many ways of approaching the question. Let us, for example, examine the proceedings of such representative bodies as the British Association and the Royal Geographical Society, and of such assemblies as the International Geographical Congresses, and let us see if we can find out what is, as a fact, the scope of the subject as dealt with by these bodies. They are institutions which work in the full light of day, and they are too large to be dominated for any length of time by individuals. If we can find any working principle, any common term, amongst these societies, we shall have gone some way towards arriving at a solution of the problem.

A simple method of investigation is to discuss the character of the publications of these societies and of the lectures delivered before them. And I feel that I cannot do better than devote most of this brief analysis to the Royal Geographical Society and its admirably edited Journal. Here we are on safe ground. If an inhabitant of another planet wished to know what we understand by astronomy we could confidently refer him to the Monthly Notices of the Royal Astronomical Society. If he were curious about the condition of geology, we should give him the volumes of the Geological Society. And, if he were so rash as to ask what are the objects of the modern mathematician, we should hand him the papers published by the London Mathematical Society. The "Geographical Journal" occupies no lower a position with reference to Geography than do the other journals mentioned with reference to the sciences with which they deal.

In analysing the contributions to the Royal Geographical Society it is important to start with an honest classification. In the endeavour to be impartial I have chosen the classification which was adopted for the last International Geographical Congress, *i.e.*, that held at Geneva in 1908. This Congress was divided into fourteen sections. It will serve to clear the ground if we deal first with sections 12, 13, and 14; these are the Teaching of Geography, Historical Geography (which was mainly concerned with the history of travel and exploration), and Rules and Nomenclature. For the purpose of discovering what Geography is these three sections will not be of any assistance. Every subject has its educational side, its history, and its rules and nomenclature. The subject proper was, therefore, divided into eleven sections. The eleven sections are the following:—

1. Mathematical and Cartographical Geography.
2. General Physical Geography.
3. Vulcanology and Seismology.
4. Glaciers.

5. Hydrography (Potamography and Limnology).
6. Oceanography.
7. Meteorology and Climatology; Terrestrial Magnetism.
8. Biological Geography.
9. Anthropology and Ethnography.
10. Economic and Social Geography.
11. Explorations.

Before applying this classification to the work of the Geographical Society I wish to call attention to the extremely frank way in which vulcanology, seismology, meteorology, climatology, terrestrial magnetism, anthropology, and ethnography, are included in Geography. The list in fact covers ground occupied by several sections of the British Association.

I have investigated the work of the Geographical Society for the five complete years 1906 to 1910. The original contributions to the "Geographical Journal" have been examined for that period, omitting from consideration contributions on the subjects of teaching, the history of exploration, and rules and nomenclature.

There are altogether 296 original papers which come under one or another of the eleven headings given above. Of these papers, 171, or 57 per cent., deal with Explorations and Travels. There is a great drop to the next largest section, General Physical Geography, which accounts for thirty papers, or about 10 per cent. Adhering to the order of the Geneva Congress the complete list is as follows:—

Original Contributions to the Proceedings of the Royal Geographical Society during the five years 1906 *to* 1910.

	Percentages.
1. Mathematical and Cartographical Geography	3
2. General Physical Geography - - -	10
3. Vulcanology and Seismology - - -	5
4. Glaciers - - - - - - -	3
5. Hydrography (Potamography and Limnology)	5
6. Oceanography - - - - - -	3
7. Meteorology and Climatology: Terrestrial Magnetism - - - - - -	3
8. Biological Geography - - - - -	1
9. Anthropology and Ethnography - - -	3
10. Economic and Social Geography - - -	7
11. Explorations - - - - - -	57

The main conclusion is obvious enough. For the principal Geographical Society in the world, Geography is still mainly an affair of explorations and surveys; if to this item we add cartography we account for 60 per cent. of the activities of the Society.

There is another important deduction which is natural and unforced: the papers on vulcanology and seismology and on glaciers could have been read with perfect appropriateness before the Geological Society; those on meteorology and climatology before the Meteorological Society; and those on anthropology and ethnography before the Anthropological Society. To make quite sure of this point I will cite a few titles of the papers read: "The great Tarawera Volcanic Rift," by J. M. Bell; "Recent Earthquakes," by R. D. Oldham; "Glacial History of Western Europe," by Professor T. G. Bonney; "Climatic Features of the Pleistocene Ice-Age," by Professor A. Penck; "Rainfall of British East Africa," by G. B. Williams; "Geographical Distribution of Rainfall in the British Isles," by Dr. H. R. Mill; "Geographical Conditions affecting Population in the East Mediterranean Lands," by D. G. Hogarth; "Tribes of North-Western Se-Chuan," by W. N. Fergusson.

This little list of typical subjects indicates clearly that there is a large group of contributions which would have found an appropriate home in the journals of the Geological, Meteorological, and Anthropological Societies; there is a possible corollary that, since men who make a life study of these subjects are best capable of dealing with them, the authors of the above type of paper who submit their work to the Geographical Society, in so doing appeal rather to the public at large than to men of their own special sciences.

We may therefore sum up the results of this brief investigation into the work of the Royal Geographical Society by saying that 60 per cent. of it is concerned with exploration and mapping, and that some of the remainder could be dealt with appropriately by the learned societies concerned, but that the Geographical Society serves as a popularising medium. It also serves a useful purpose as a common meeting-ground for vulcanologists, seismologists, oceanographers, meteorologists, climatologists, anthropologists, and ethnographers

Another line of investigation may be profitably pursued. Who are, by common consent, the leading geographers of the world? No doubt the explorers come first in popular estimation, such men (omitting British names) as Peary, Charcot, Sven Hedin. Then after this type would come the men of learning who stand out in any International Congress. These men stand out because they have, by their own exertions, increased the sum of human knowledge. Omitting for the moment the consideration of exploration and mapping, we find that in an international congress a large number of the most celebrated geographers are eminent as geologists. In such a gathering we can also pick out those who have advanced the sciences of meteorology or anthropology. Is there such a thing as an eminent geographer *per se*? There are those who say that, apart from explorers, the nearest approach to such a being is the compiler who popularises the results obtained by men working in definitely scientific branches of knowledge.

To revert to the ideas gathered from an international congress, let us suppose the position reversed. Let the functions of geology be supposed to be somewhat in dispute and those of geography perfectly definite, and further let us suppose that at an international meeting of geologists a large proportion of the men of real distinction were geographers. We may in this way get an idea of what geography looks like from the outside.

I think that at this point we may explain, in a preliminary way, the work of the Geographical societies, after the fashion of the "Child's Guide to Knowledge":—

Question: What is Geography?

Answer: There is no generally accepted definition of Geography.

Question: Can we not form some idea of the scope of the subject by considering the work of the Royal Geographical Society?

Answer: Yes; 60 per cent. of this work deals with explorations, surveys, and mapping, and of the rest a considerable portion consists of matter which could be discussed appropriately before the Geological, Meteorological, and Anthropological Societies.

Question: What, then, leaving maps out of consideration, are the useful functions of a Geographical Society?

Answer: A Geographical society serves to popularise the work of men who labour in certain fields of science, and such a society forms a very convenient meeting-ground for them.

Question: What is a geographer?

Answer: The term geographer is sometimes applied to explorers; sometimes to men who compile books derived mainly from the labours of surveyors, geodesists, geologists, climatologists, ethnographers and others; sometimes to those who compile distributional maps.

Question: Can a geographer who has not made a special study of one or more of such subjects as geodesy, surveying, cartography, geology, climatology, or ethnography, hope to advance human knowledge?

Answer: He can do much to popularise these subjects, but he cannot hope to do original work.

Another way of attempting to ascertain the meaning and object of Geography is to study the character of the instruction given in the universities, and we may suppose that this can be fairly judged by the contents of standard text-books. Let us take, for example, the "Traité de Géographie Physique" of M. E. de Martonne, formerly Professor of Geography at the University of Lyons, now Professor at the Sorbonne. The work in question was published in 1909 and is divided into four main sections—Climate, Hydrography, Terrestrial Relief, and Biogeography.

The first sentence of the book is "What is Geography?" Twenty-four pages are devoted to discussing this question, which the writer, with all his skill and learning, finds it difficult to answer definitely and convincingly. One receives the impression of the dexterous handling of a difficult question, and of a generally defensive attitude. In this book geography is said to depend on three principles. The principle of *extension*, the principle of *co-ordination*, and the principle of *causality*. As an illustration of the meaning of the principle of extension, we are told that "the botanist who studies the organs of a plant, its conditions of life, its position in classification, is not doing geographical work; but if he seeks to determine its area of extension, *il fait de la géographie botanique*. I believe that we have here reached a critical point. The claim is, that when, in the prosecution of a botanical study, a map is used to show the distribution of a plant, the use of such a map converts the study into a branch of geography. Well, it is a question of definition and convention, which cannot, I imagine, be settled except by the general agreement of all the sciences. We have to make up our minds whether a man who constructs a distributional map is doing "geography." One thing, I suppose, is not doubtful. When the map is made it will be better interpreted by a botanist than by a person ignorant of botany. In the same way the discussion of an ordinary geological map is best undertaken by a geologist, and so on. It would appear that geography, in the sense mentioned, is not so much a subject as a method of research.

It will be convenient here to say a few words about the relations between societies and schools of Geography and those two important subjects geodesy and geology. In the palmy days of the Ordnance Survey, when Colonel A. R. Clarke was still at work, the headquarters of geodesy in England was doubtless at Southampton. But, curiously enough, there is not, and has never been, in the United Kingdom a society or body specially charged with the study of geodesy. Geodesy, in fact, has no regular home in these islands. But the Royal Geographical Society has done a good deal in the past few years to stimulate an interest in the subject, thereby fulfilling what I believe to be one of the Society's most useful functions, that of popularisation.

If, however, an authoritative opinion were required on any geodetic question, where could it be obtained? Well, I suppose there is no doubt that the headquarters of this branch of learning is the International Geodetic Association, but the scientific work itself is being largely carried out at the Geodetic Institute at Potsdam, by the Survey of India, by the Geodetic Section of the Service Géographique, by the U.S. Coast and Geodetic Survey, and by similar bodies. Geodesy, especially in its later developments, is a definitely scientific subject which demands much study and application. It is but slightly touched upon by the schools of Geography. Perhaps I may here point out that geodesy is by no means mainly concerned with the shape of the spheroid. The chief problems are now those of isostasy and local attraction generally, the real shape of the sea-surface, the continuity of the crust of the earth and changes of density therein.

The position in which Geography finds itself with regard to Geology can be clearly seen if reference is made to the new edition of the "Encyclopædia Britannica." In the eleventh volume of this work are two important articles, "Geography," by Dr. H. R. Mill, and "Geology," by Sir Archibald Geikie. In the article on "Geography" we find a description of geomorphology as that part of Geography which deals with terrestrial relief, and a remark is made that "opinion still differs as to the extent to which the geographer's work should overlap that of the geologist." In this article, however, most of the authorities quoted are geologists, and the author remarks that "the geographers who have hitherto given most attention to the forms of the land have been trained as geologists."

Turning to the article on "Geology" we find an important section on "Physiographical Geology," which is described as dealing with the investigation of "the origin and history of the present topographical features of the land." Now this is the exact field claimed for geomorphology. It has been observed by others, notably by Professor de Martonne, that the interpretation of topographic forms has been most successfully undertaken by geologists, and he gives as an instance of this the good work done by the United States Geological Survey.

I do not know whether any geographer untrained as a geologist has contributed anything of value to geomorphology.

Another test which may be applied is the following: Let us imagine Geography to be non-existent and note what the effect would be. Suppose there were no such things as Government Geographical Services, or Schools of Geography at the Universities, or Geographical Societies. The first and most obvious result would be that most, if not all, of our apparatus of exploration and mapping would have disappeared. But as we are all in agreement as to the necessity of this branch of human effort, let us restore this to existence and examine the effect of the disappearance of the rest.

So far as concerns geodesy, we should still possess the International Geodetic Association, the Geodetic Institute at Potsdam, and the United States Geodetic Survey, and similar bodies. But we should have lost the means of popularising geodesy in the proceedings of Geographical Societies; and, as there would be now no geographical text-books, elementary geodesy would not find itself between the same covers as climatology and geomorphology.

As regards geomorphology, or physiographical geology, not very much difference would be noted. The geologists would still pursue this important subject; but here again their writings would perhaps appeal to a more expert and less popular audience; although it is not to be forgotten that many admirable introductions to the subject have been written by geologists.

Much the same might be said about meteorology and climatology. There would be text-books devoted to these studies, but there might be a diminution of popular interest.

Such names as phyto-geography would disappear, but the study of botany (if we permit it the use of distributional maps) would not be affected. The loss to knowledge would be mainly that of getting to a certain extent out of touch with the public. The constitutions of the various learned bodies would remain the same and so would their functions. The constitution of the Royal Society, which has never recognised geography as a subject, would be totally unaffected.

If we thus study the relations between Geography and other subjects we are almost bound to arrive at the conclusion that Geography is not a unit of science in the sense in which geology, astronomy, or chemistry are units. If we inquire into the current teaching of Geography, and examine modern text-books, we find that most of the matter is derived directly from the workers in other fields of study. And if we inquire into the products of Geographical societies, it becomes evident that one of the most important functions fulfilled by these useful bodies is to popularise the work of geodesists, geologists, climatologists, and others, and to provide a common meeting-ground for them. If Geography had been able to include geology and the other sciences which deal with earth-knowledge, it would then, indeed, have been a master science. But things have worked out differently.

I shall very probably be told that, in laying some stress on the above-mentioned aspects of the subject, I have forgotten that the main purpose of Geography is the study of the earth as the home of man, or the study of man as affected by his environment, and that, however necessary it may be to begin with a foundation of geodesy, geology, and climatology, we must have as our main structure the investigation of the effect of these conditions on the races of man, on human history and human industry, on economics and politics.

It is obviously and abundantly true that no student of history, economics, or politics can disregard the effect of geographical environment. But it is not, as a fact, disregarded by writers on these subjects. The question is, to a large extent, whether we should annex these portions of their studies, group them and label them "Geography." Our right to do this will depend on the value of our own original investigations. We have the right to use the results obtained by others, provided that we add something valuable of our own.

Before this human aspect of geography—or, for that matter, any other aspect of the subject—is recognised by the world of science as an independent, indispensable, and definite branch of knowledge, it must prove its independence and value by original, definite, and, if possible, quantitative research.

PART II. *Geography and the Government Departments.*

Whatever definition of Geography is accepted we are all in agreement that the map is the essential foundation of the subject. I propose now to indicate very briefly how the British Government, as represented by the great Departments of State, is, in this respect, assisting the cause of Geography. The Departments which are interested in maps and surveys are the following:—The Admiralty, the War Office, the Colonial Office, the India Office, the Board of Agriculture, and the Foreign Office.

The immense services rendered, not only to this country, but to the whole world, by the Hydrographic Department of the Admiralty, are known to all. But it would be somewhat rash for a soldier to talk about hydrographic surveys, so I will confine my remarks to surveys on land.

First it should be remarked that the British Government as a whole has for many years shown its interest in Geography, and has recognised the good work done by the Royal Geographical Society by contributing an annual sum of £500 towards the funds of the Society. Next it should be noted that from time to time British Governments have contributed large sums of money towards Arctic and Antarctic exploration. The most recent examples of this very practical form of encouragement will be remembered by all; I mean the Government expenditure on Scott's first Antarctic Expedition and the handsome sum contributed towards the cost of Shackleton's great journey.

Turning now to the *War Office*, the first matter to which I would call attention is that nearly all the accurate topographical surveys of the Empire have been started by soldiers. This applies to the United Kingdom, Canada, Australia, South Africa, Tropical Africa, and last, but greatest of all, India. The accounts of the struggles of soldiers at the end of the eighteenth century to obtain sanction for what is now known as the Ordnance Survey form very interesting reading. In fact, all over the world it was military requirements which produced the topographical map; and it is still the War Offices of the world which control the execution of almost all geographically important surveys. During the last few years the largest block of work undertaken by the War Office has been the accurate survey of the Orange Free State, which has an area of about 52,000 square miles—nearly the size of England—and an adjacent reconnaissance survey in the Cape of Good Hope covering an area of a hundred thousand square miles. There has been some inevitable delay (due to causes which need not be gone into now) in the publication of the sheets of this survey, but the work is being pushed on. The survey of the Orange Free State is fully comparable with the admirable surveys carried out by the French Service Géographique de l'Armée in Algeria and Tunis. Some work has also been done in the Transvaal. Other surveys carried out in recent years under the direct control of the War Office are those of Mauritius, St. Helena, a portion of Sierra Leone, Malta, and Hong Kong. The most notable work which is now being carried out in *the Self-Governing Dominions* is the Militia Department Survey of Canada, with which excellent progress has been made.

The total area of the Crown Colonies and Protectorates, under the rule of the *Colonial Office*, amounts to about two million square miles. British African Protectorates form a large portion of this total, and I will indicate briefly what is being done to survey these tropical Protectorates. From the geographical point of view the brightest regions are East Africa, Uganda, and Southern Nigeria. In East Africa topographical surveys of the highlands and coast belt are being pushed on by military parties as part of the local survey department. The area of exact work done amounts now to some 30,000 square miles. In Uganda a military party has recently completed a large block of country, and in this Protectorate thoroughly reliable maps of 32,000 square miles are now available. In Southern Nigeria a completely reorganised survey department is tackling in a thoroughly systematic fashion the difficult task of mapping a forest-clad country. We shall shortly see the results.

For the information of those who have not travelled in Tropical Africa it should be remarked that surveying in such countries is attended by every sort of difficulty and discomfort, and too often by illness and serious discouragement. It is one thing to sit at home in a comfortable office and plan a scheme of survey, and quite another thing to carry it out on the spot. We do not, I am convinced, give enough honour and credit to those who actually get the work done in such trying circumstances. Honest accurate survey work in the tropics puts a much greater strain on a man than exploratory sketching. To picture what the conditions are, imagine that you are to make a half-inch survey of the South of England; cover the whole country with dense forest; put mangrove swamps up all the estuaries; raise the temperature to that of a hot-house; introduce all manner of insects; fill the country with malaria, yellow fever, blackwater fever, and sleeping sickness; let some of your staff be sick; then have a fight with the local treasury as to some necessary payment, and be as cheerful as you can. That is one side of the medal. On the other side there is the abiding interest which the surveyor feels in the country, the natives, and the work; the sense of duty done; and the satisfaction of opening up and mapping for the first time a portion of this world's surface.

There is no time to mention other surveys in Africa, and I will pass on to a very interesting part of the world, the Federated Malay States. In this prosperous country much excellent geographical work is being done by the combined survey department which was established under a Surveyor-General in the year 1907. The department is in good hands, and the commencement of a regular topographical series is being undertaken.

I wish it were possible to prophesy smooth things about Ceylon. From our special point of view the situation leaves much to be desired. There is not yet published a single topographical map, and the topographical surveys are progressing at a rate which, under favourable conditions, may result in the maps being completed in the year 1970.

In closing this inadequate review of the principal surveys which are being undertaken in the Crown Colonies and Protectorates, I should mention that the co-ordinating factor is the Colonial Survey Committee, which every year publishes a report which is presented to Parliament.

The *India Office* is of course concerned with that great department the Survey of India. The Indian Empire has an area of about 1,800,000 square miles, and as, under the arrangements approved in 1908, the standard scale of survey is to be one inch to one mile, the area of paper to be covered will be 1,800,000 square inches. Actually this is divided into about 6,700 sheets. The Survey of India has always been famous for its geodetic work and for its frontier surveys and methods. Its weak point used to be its map reproduction. This has been greatly improved. But personally I feel that if, for most military and popular purposes, a half-inch map is found suitable for England, as is undoubtedly the case, there is no reason why a half-inch map should not also be suitable for India. It is mainly a question of putting more information on the published map, and of engraving it and using finer means of reproduction. If this smaller scale were adopted all the information now presented could be shown, and the number of the sheets would be reduced from 6,700 to 1,675, a saving of 5,000 sheets. It is difficult to avoid the feeling that the Survey of India is over-weighted with the present scheme. The scheme has, however, many merits. It will be impossible to carry it out unless the department is kept at full strength.

The *Board of Agriculture* is the Department which is charged with the administration of the Ordnance Survey. The Ordnance Survey spends some £200,000 a year, and for that sum it furnishes the inhabitants of the United Kingdom with what are, without doubt, the finest and most complete series of large-scale maps which any country possesses. There is nothing in any important country (such as France, Germany, Italy, Russia, or the United States) to compare with our complete and uniform series of sheets on the scale of $^1/_{2500}$. These sheets are sold at a nominal price and are in effect a free gift to landowners, agents, and all who deal with real property. They are also, of course, invaluable to county and borough engineers and surveyors. They really are a national asset which is not half enough appreciated. The whole conception of these large-scale plans has stood the test of time and is greatly to the honour of a former generation of officers.

Much might be said about the small-scale maps of the Ordnance Survey, which are now published in a very convenient form. As mentioned above, the latest small-scale Ordnance map is the new international map on the million scale. Some sheets of this map will shortly be published.

The *Foreign Office* is concerned with the surveys of the Anglo-Egyptian Sudan, which are at present mainly of an explanatory character. The taking over of the Province of Lado has recently thrown fresh work on the Sudan Survey Department. The Foreign Office, which administers Zanzibar, has recently given orders for the survey of the Island of Pemba, a dependency of Zanzibar, and this is being carried out by a small military party.

But the greatest service to Geography rendered by the Foreign Office in recent years was the encouragement given to the project of the International Map by the assembly of an international committee in November 1909. Sir Charles, now Lord, Hardinge presided at the opening session. There were delegates from Austria-Hungary, France, Germany, Great Britain, Canada and Australia, Italy, Russia, Spain and the United States, and, as is known, the resolutions which were devised by the Committee were agreed to unanimously. After the conclusion of the work of the Committee the Government communicated the resolutions to all countries which had not been represented, and nearly all the replies which have been received are favourable. Maps in exact accordance with the resolutions are, it is understood, being produced by France, Hungary, Italy, Spain, the United States, and other countries, and so far as we are concerned, by the General Staff, the Ordnance Survey, and India. These maps will be shown at the International Geographical Congress which meets at Rome in October next.*

I have now come to the end of this rapid sketch of the geographical work of the official world. It is work which, though often of an apparently humdrum character, outweighs in importance the sum total of all which can by any possibility be undertaken by private agency or by societies. But it is the very legitimate business of societies to criticise and encourage.

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* This Congress has been postponed to March, 1913.

It is, in fact, not only our manifest duty to encourage the systematic mapping of the world on which we live, but we should do all we can to ensure the perfection, and suitability for their special purposes, of the maps themselves. In the surveying of the earth's surface and its representation by means of maps we are treating of matters which are essentially and peculiarly our own.

It would appear that another great function of Geography, as represented by Geographical societies and congresses, is to serve as a popularising medium for such sciences as geodesy, geology, climatology, and anthropology, and also to serve as the means of bringing together the workers in these sciences. We may be told that so far as this Association is concerned the exact study of geodesy and meteorology is dealt with by Section A, geology by Section C, and anthropology by Section H, but there is, I believe, no other section which forms a more convenient general meeting-ground for all the workers in the various divisions of earth-knowledge. We ourselves have our own special work, work which is shared by no others, the great task of mapping the world. This task is such a necessary one, and it is of such genuine value to so many studies, that by assisting in it we are really furthering the Advancement of Science, which is the object of this great Association.

Mr. J. Howard Reed, F.R.G.S., before giving his Report (see page 69) criticised the preceding Address in the following words (other criticisms may be found in the Journals of the Royal Geographical Society, the Royal Scottish Geographical Society, the American Geographical Society, and other Societies):—

Your representative listened with much care to the Address delivered by the President, and has carefully read the Address since its delivery, but he is compelled to confess that even now he is in doubt as to the true opinions of the President regarding the position of Geography as a science, its value as an educational study, and of the position of those who have hitherto been regarded as geographers. Whether Col. Close intended it, or not, he certainly succeeded in making it appear that no one had a right to be considered worthy of being called a

Geographer who had not either carried out some original geographical exploration, or become an expert geodesist or cartographer. "What is a geographer?" asks the President, and to his own question he replies: "The term geographer is sometimes applied to explorers; sometimes to men who compile books derived mainly from the labours of surveyors, geodesists, geologists, climatologists, ethnographers, and others; sometimes to those who compile distributional maps." "Can a geographer," he continues, "who has not made a special study of one or more of such subjects as geodesy, surveying, cartography, geology, climatology, or ethnography, hope to advance human knowledge?" Again he answers his own question by saying: "He can do much to popularise these subjects, but he cannot hope to do original work."

Your delegate is at a loss to understand how any person can "popularise" any of the subjects mentioned by Col. Close, unless he has first made a "special study" of them. It is difficult to explain a subject of which one knows nothing, and still more difficult it may be imagined to "popularise" it.

The President's reasoning would, if rigidly applied, rule out of the list of geographers many of the past presidents of Section E, and would sweep away from the roll more than one recognised expert geographer who has occupied the president's chair with honour and distinction within the last half dozen years. Not only so, but the vast majority of the Fellows of the Royal Geographical Society, and almost all the members of the various provincial societies would also have to be crossed off a list of geographers.

It would, in my opinion, be better to widen the geographical portals than to restrict them as the President's address would suggest. The first Secretary of this Society, the late Mr. Eli Sowerbutts, used to say that Geography was knowledge of the earth regarded as the home of man, and that in that sense all the branches of science, mentioned by Col. Close in his questions, and many others, were departments of Geography. From the point of view of Manchester people Commercial Geography forms an important branch of the all embracing subject, but with regard to this Col. Close says nothing whatever. His well informed and scientific mind is doubtless quite alive to the importance of the commercial aspect of Geography, although he excluded all reference to it from his address, but it is somewhat striking that although papers more or less commercial in character have in past years been read before Section E, they were at the 1911 meeting conspicuous by their absence; and to this extent the section suffered.

The members of this Society need not be depressed if they do not happen to be experts in any of the branches of Geographical Science enumerated by Colonel Close. They, at any rate, may continue to do what they can to "popularise" Geography, and in doing this they will find themselves working shoulder to shoulder with most of the world's recognised geographers.

A JOURNEY THROUGH NINE MOORISH PROVINCES.

By Donald Mackenzie.*

When I arrived in Marrakesh (Morocco city) on the last day of October, 1911, Mr. Lennox, the British Vice-Consul, and myself made arrangements to visit the great provinces around the southern capital of the Moorish Empire. We set out on the 2nd of November, and made our way through Oolad Delim to the province of Hammar, so named on account of its red soil, we came across great tracts of blue slate running through this country in various positions, and this seems to be the principal geological feature of the whole of this part of Morocco, and reaches right up to the Atlas Mountains. Water, however, is found in abundance at a short distance from the surface, and can be used for irrigating purposes. The principal industry of Hammar, like other provinces around Marrakesh, is agriculture. This is the backbone of the whole country. Douars or villages are met with everywhere. These are centres of agricultural activity in which the farmers and workers collect for mutual protection. In most cases they consist of circular reed huts, surrounded by hedges of dry thorn, which afford their flocks security at night. A few houses built of dry clay are met with, occupied by the better class. The rooms of these habitations are fairly comfortable. The dogs, which abound in these parts, make a very effective police, as we found from experience. They attacked us in one place in a most ferocious manner. We turned on them with stones, and finally we became the victors. Around these villages underground caves are found for the storage of grain, and there are others for preserving straw. Each village has one or two threshing floors, where the tread of the oxen or camels separates the corn from the straw; then the husk is removed in the most primitive manner. The whole process of farming reminds one of the kind of husbandry that must have existed in the East in the days of Abraham. The wooden plough, which only scratches the ground, is used all over the country. The oxen, the horse, the mule and the camel are used for ploughing; but I rather think that the farmers would soon fall into using modern agricultural implements when they saw the advantages which they would gain by their adoption. There are no carts, so all agricultural produce is brought home from the fields on the backs of animals, and even of women—a very slow process. The stack of corn, if not seized by rapacious kaids, is partly used for the family and the surplus is sold to pay taxes or some other exactions imposed on them by the Moorish Government. The only people who can snap their fingers at the tax gatherer are the Simsars and in a lesser degree the Mohalateens. These Moors enjoy foreign protection. The former are entirely exempt from paying any taxation; the latter have to pay a certain amount of taxes. These men therefore grow fat and rich at the expense of their less fortunate neighbours. In a conversation with our host at Hammar he pointed out that the English people were governed by their women. In confirmation of this idea he said that when we saw an English lady pass we took off our hats to her. He took off his turban to illustrate his meaning. We pointed out to him that we raised our hats out of respect to the sex, and that while women in England had great influence, it was generally directed for the good of the people. He himself afterwards admitted that he had to take off his turban to some of his three wives. The women in Morocco are practically the slaves of the household. Long before dawn we could hear the women grinding corn for the day's meal. At an early hour it was made into round flat cakes, which were brought before us soaking in butter and honey, quite warm from the oven. When the butter was good and the cook clean it was rather pleasant to eat. They made other cakes as thin as paper. I could not understand how it was done. I think it would puzzle any English baker to make such. The first dish that appears in the morning is a thin porridge made with meal, milk and butter. Then come hot cakes and butter; after that roast fowls. There may be two courses. Of these, cooscoos comes next. This is the great national dish of Morocco. The breakfast winds up with green tea and mint, with abundance of sugar, which is the favourite drink of the Moors. This is the breakfast of the well-to-do classes, but the poor people are glad to get dry bread and water and a few dates. They are most frugal and simple, and yet most charitable to those poorer than themselves. This is one of the best features of the Moorish character, which I trust will always remain with them. Hospitality to strangers is another Moorish virtue which cannot be praised too highly.

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* See *Journal*, vol. ii., p. 146, for account of Mr. Mackenzie's previous experiences in Morocco.

The principal and most important provinces and places which we passed on our journey are as follows:—Hammar, Rahamna, El Glintoor, Loowetta, Oolad Delim, Mannabha, Saraghna, Izmaran, Ghujdamma, Glower Tizart, Misfewi Ooruka, Ghuwetum, Gurgoor, Amzmeez, Imineeste, Imin Tella, and Tamslaught. All these places are agricultural lands of the highest quality, with abundant supply of water. They could be made with little labour to yield the richest crops that could be produced in any part of the world. As an indication as to what these lands are, a furrow could be made about twenty miles long on level ground without scarcely meeting a stone. Red earth is the predominant feature of these great plains, with a blue stratum of slate here and there. There are several important rivers and streams running through this country which could be utilised for irrigation. Great stretches of land belong to the Moorish Government: the other portions are the property of the tribes and private individuals. In some parts we meet great tracts of olive plantations. Their dark foliage and the high majestic palms make a scene of exquisite beauty. The enormous depth of red soil which we met in these parts covers hundreds of miles of surface and forms the most fertile land in Morocco, capable of producing anything. It was afterwards that I found the source of this extraordinary formation, which I shall explain later on. The principal products are maize, wheat and barley. The great flocks and herds which we saw grazing around us as we passed along were sheep, goats, cows, bullocks, mules, horses, donkeys and camels. The Moors told us that the sheep bore their young three times a year. I could see that the breed of cattle required improvement, as they were very small in size. The butter which they produce is unfit for exportation on account of the taste and their dirty method of working it and making it up. But under modern conditions and improved pasture the exportation of butter should form an important branch of the trade of Morocco. On the other hand, if the breed of cattle were improved an important cattle trade could be established. I believe also that cotton could be cultivated far more profitably in this part of Morocco than in Egypt. This was the opinion of Muley Abdul Aziz in a recent conversation I had with him on the land of Morocco. He remarked that while in Egypt he visited the cotton fields there, and he was of opinion that this cultivation could be profitably carried out in Morocco.

The most powerful tribes who dominate the principal provinces we passed through are the Rahamna, Hammar, Saraghna, Oolad boo Sbaa and Izemaran. These are all most friendly to the British, and would receive them with open arms. We found one tribe among them who are still loyal to Muley Abdul Aziz. They refuse to pay taxes, and are independent. On that account they are called Abdul Azizees. They were engaged in fighting when we came amongst them. They possess modern arms; how they obtain them I do not know. The long-barrelled flintlock gun on which the Moors pinned their faith for many centuries is now at last discarded; they find it of no use against modern weapons. We found all the great tribes quiet and peaceful.

I have already referred to the hospitality of the Moors, which I hope will never disappear. They cannot do enough for their visitor; they supply him with such food as the country produces in abundance and promote his comfort in every way. They are naturally charitable. I have seen quite poor people sharing their bread with those poorer than themselves. What an object lesson to Christians. A picturesque feature of the custom of these people is that when they heard that we were approaching their district the chief men, mounted on horses, with spotless white flowing robes, accompanied by mounted soldiers fully armed, would ride out to meet us at a considerable distance. We were saluted, and then the whole procession formed up and rode on until we marched into the village. We were highly amused when, passing one little village situated in a cosy corner in the hills, they invited us to come to them, saying that the dinner was ready and the kettle boiling; but, however tempting the invitation, we did not accept it, but proceeded on to another village. An object of great interest to me on this journey was the site of the ancient capital of Southern Morocco, known by the name of Ghamat. Only a few fragments now remain, and the great water course which brought water into the town can still be traced. The squares and gardens of this city are now turned into ploughed fields. The mosque could be seen in the distance. The history of the old city itself is lost in the mist of ages. There are no inscriptions, only mounds of mud walls, to tell the interesting story of this ancient city. In the course of our journey we passed the source of the river Tensift. It takes its rise from a spring near some hills in the east of Marrakesh.

After examining the great provinces of the plains we made our way to the Atlas Mountains up towards the Glowi. We climbed up with some difficulty to the top of a portion of the lower Atlas. Here we found a small collection of houses, near the white tomb of the saint known as Sidi Boo Nagga. Why he should be named the father of the she camel I could not tell, nor could anyone else. The tomb stood on a great height overlooking the plains, while as a background stood one of the towering peaks of the Atlas covered with a mantle of snow. It made us imagine we had got into winter quarters, it was so cold. Standing on one of the hills while the sun was setting we could clearly see the great provinces of the plains like an immense sheet spread before us, dotted here and there with hills, and the winding rivers could be traced as if shown on a map. We had thus a panoramic view of hundreds of miles of country. One would imagine from the height on which we stood that we had all the northern portion of Morocco at our feet. Our host pointed out the scene of Abdul Aziz's last struggle for his crown. It was when I entered this and another portion of the Atlas Mountains that I was able to understand what produced those great plains of red earth which lay before our gaze. The Atlas is principally composed of limestone rock, gypsum, blue slate and red earth. This rich soil has been washed, by rain and snow in the course of ages, down through the deep gorges and valleys to the plains below and covered them in some places to a depth of 18 feet. This is the source of the great fertility of the plains. Until I visited the Atlas I was under the impression that these mountains were barren and the habitation of wild goats, Oudad and beasts of prey, without any settled population. But how different I found the country. It is full of great valleys of wonderful fertility far surpassing any other part of Morocco. It is thickly populated, studded all over with Berber villages right along the sides of the valleys. The land is beautifully cultivated in terraces, which are irrigated by water from the abundant springs which are found here everywhere. In the distance we could see the dark pine woods and other trees. The juniper, which grows to a great size here, and oleander seem to be the principal shrubs. In the valleys there are beautiful groves of olive trees, also walnut and other fruit trees are found in the valleys. The inhabitants cultivate maize, wheat and barley, and black grapes of a very superior quality are cultivated and trained on bamboo canes. In November black clusters of grapes hung in rich profusion equal to any hothouse grapes. The houses in the Atlas are built of stones with peculiar verandahs upstairs, quite differently to the Arab houses on the plains. The inhabitants are Berbers, a most hard-working race. They are very kind and hospitable to strangers. I feel sure that neither Switzerland nor any other country can show such grand scenery as is found in the Atlas Mountains, an ideal country for summer residence for English people who like sport and mountain climbing. During this journey we penetrated the Atlas in two places, making our way to Sidi Boo Nagga in the east; and afterwards into the Atlas in the west, above Amzmeez and west of Eureka. The scenery around us was very grand, but our paths were very difficult; the great deep gorges we had to pass being in some places dangerous. At last we came to a village perched up on the side of a rock with a constant running stream passing near. Here we found women washing their clothes. The stream watered the productive terraces which we found around us. We took up our quarters with a very nice native, who gave us a hearty welcome and made us quite comfortable. As I looked around me in the evening I could not help admiring the splendid cultivation carried on by these people who had never been out of their own country. They deserve a good Government who would give them security and justice that would enable them to enjoy the fruits of their labour in peace. Next day we proceeded up by the side of this valley over some high almost perpendicular cliffs until we came down to a deep gorge presenting one of the grandest sights that I had ever seen. As we proceeded we heard the sound of rushing water. At last we came to a great spring, an immense volume of water issuing with great force from under a rock of about 400 feet high. From here the stream went down rocky falls until it reached the lower valley. This spring is the source of the Amzmeez river, tributary of Nefiss and the Tensift rivers. The name of this place is Imin Tella. Mr. Lennox went pigeon shooting while I wandered about looking at and admiring the surrounding scenery. Several people passed to and fro from other valleys in the mountains. The marvels of this wonderful place were not yet exhausted. The natives pointed out on a high rock the ruins of an old fortress, said by them to have been built by the Christians ages ago. We climbed up to view it—almost an inaccessible spot. Only a few low walls now remain. It seemed to me to have been built by the Mauritanians, from whom the present inhabitants have probably sprung. The real history of this interesting ruin is now lost, but it was evidently built for the purpose of defending this valley from the inhabitants of the plains. The physical formation of the Atlas would enable a few resolute men to defend this part of the country even with stones against a whole army.

I was informed that the inhabitants of the Atlas cultivate large tracts of land in the plains. They keep a few men on the spot to look after the crops until the time of harvest, when they go down with an army of reapers to cut the corn. After the operation of harvesting is over they retire to their mountain homes. These strange mountaineers are great bee-keepers. Bread, honey and butter they generally lay before strangers. The honey, I must say, is of fine quality and flavour and the butter is very good. The cows, donkeys, mules and horses live in the same buildings with their masters. The cows are very small, similar to those of the plains. The Berbers who inhabit the mountains and the plains and form the bulk of the population of Morocco, have old institutions of a republican character which may come into play later on. They are known as the Jamaa and Ait Arvaieen or the great Councils of the people. It is against these representative institutions that the Sultan and his Government have been fighting for centuries past. They have been treated most cruelly. We heard that not long ago a Moor purchased the government of one of the tribes from the present Sultan and his ministers for a sum of about £10,000. As a matter of form he sent a message to the tribe asking their views as to whether he was to rule over them. They sent eighteen of their chief men as delegates. When they were asked their views they replied that they would like to consult the tribe before giving a definite answer. The poor men never had the chance; the Kaid ordered their heads to be cut off, and then announced that he was the Kaid of the tribe. This is how the Sultan and his ministers have for years stifled the voice of the people. But I am glad to say that a new spirit has now arisen which may defy the Sultan and his ministers and bring about a great change in the whole situation. If only the Sultan would be wise enough to call to his aid the great and ancient Council of his people for his guidance and to help him in forming a good Government for his country, great things might be done for the improvement of the condition of his people. I found a spirit in favour of reform among all classes, and I did all I could to encourage it. As an evidence of this spirit I found the authorities quite willing to improve their prisons, and much has been accomplished in this direction; and I also found that they are much inclined to copy English institutions and be guided by British officials.

On our way back to Marrakesh we passed Amzmeez on the left, surrounded by its olive plantations, and came to the holy city of Tamslaught, ruled by a shereef of the royal line. We stayed with him for the night. The next day we passed along by his olive plantations, which extend for miles. We reached Marrakesh on November 16th, after travelling nearly four hundred miles. We had been received in a most friendly manner by the people everywhere we went. I am in hopes of seeing British farmers settled in the parts we have visited, a most desirable spot for settlement, and I have also seen evidence of the richest ores that can be found in any part of the world.

With this I bring the narrative of my journey to a close. I cannot speak too highly of the kindness that I have received from British officials, also the Moorish officials and everyone with whom I came in contact.

The Journal

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* * *

CHINA, PAST AND PRESENT.

By Richard Kalisch, F.R.G.S.

(Addressed to the Society in the Geographical Hall on Tuesday, March 26th, 1912.)

Our subject to-night is a somewhat complicated one. With regard to the slides I wish to explain that I am in the habit of utilizing solely my own photographic records, but in order to be able to get properly into touch with the extreme past I have felt obliged to take advantage of the courtesy of the Royal Geographical Society, and in order to bring the paper right up to date I cabled to China for the requisite material illustrating the recent Revolution; fortunately it arrived just in time. Lastly, I am indebted to the kindness of the French weekly "L'Illustration" for permission to show you an important and interesting photograph taken as recently as three weeks ago. The remaining views are my own taking.

The upheavals in domestic and international matters have all but monopolized public attention during the last six months, or the affairs of China would have claimed much more general attention. For China plays a very important rôle towards us here in Lancashire, importing as she does one-tenth of our total production of cotton piece goods, quite apart from her consumption of this country's other manufactures. With her four hundred million inhabitants, and her four million square miles of territory, she is obviously one of the very greatest nations on earth from more than one standpoint. If only she can work out her destiny to her true advantage, she must some day occupy the place which should be hers among the great powers of the world. When we consider what has been taking place recently in this great country, our sympathies are bound to go out towards her, for is she not struggling against what has in many quarters been looked upon as inevitable—namely, the partition of her empire among aliens.

In order to be able to gauge the present situation and condition of things, we must work through the Past. Thanks to the splendid work done by the late Mr. E. L. Oxenham and to the courtesy of the Royal Geographical Society, I am able to give you a particularly clear insight into China's past, based on the intensely interesting series of maps compiled by him and published by that Society.

Let us begin about 2205 B.C., with the establishment of the Hsia Dynasty, which endured until 1818 B.C. Previous to this period, Chinese history is mythological. Ever since Yu the Great founded this dynasty, the throne of China has been hereditary, which is something definite to work upon. The map illustrating this period shows what territory came under the heading of China at that time. It was divided into nine chow or provinces. The heart of this empire was then in modern Honan. The population was but one to two millions and most of the outlying places and provinces indicated were but the settlements of pioneers. In those times they thought nothing of changing the capital of the country when necessity arose: for instance, during this dynasty, it was changed eleven times. The country was covered with luxuriant vegetation: rice fields, which now occupy almost every available space, could not exist. Wild beasts, from elephants and lions to rhinoceros abounded where now wild beasts are unknown. The influence and power of Yu and his successors was limited and became more and more so as the colonist settlements developed into semi-independent states.

When the Shang dynasty supplanted the Hsia, it started its career well enough, but gradually declined, notwithstanding its great length of existence—1766—1122 B.C. The map illustrates the great shrinkages in the empire which took place. All the south and west and a great portion of the north has disappeared.

Under the Chow dynasty which followed and which lasted from 1122 B.C. to nominally 249 B.C. (but to all intents and purposes really only up to 660 B.C.), the territory of the empire was considerably added to, particularly in the south, where for the first time it spread well over the country on to the other side of the Yangtze. The great feature of this period was what was destined to become the curse of this great unwieldy empire to this very day—the weakening of central power and authority, and the consequent rise of feudalism among the former colonist settlements which had meanwhile developed into large and important States. This dynasty also suffered from what has been the destiny of all Chinese dynasties—the founders, their sons, grandsons and great-grandsons were able and more or less conscientious men, but their successors degenerated rapidly. It was during this dynasty too that harems were introduced into the country, and they brought in their train another of China's worst features—the eunuchs and their sinister influence.

The methods of the Chows hastened the disintegration of the empire, for instance their retreat from the real capital (Hao Ching) to a minor one (Lo Yang) during a period of stress owing to the inroads of the Tartars, had the immediate effect of setting a number of these feudal states fighting amongst themselves. Many of them refused to recognise the sovereignty of the Chows, and during the so-called spring and autumn period, which lasted from 781—519 B.C., there began the loss of territory which resulted from nearly two centuries of continuous warfare.

The native map of this period is rather staggering, for the empire during the period of the Contending States, 475—249 B.C., had actually shrunk to seven small provinces. But what it had lost in quantity it had gained in quality in various directions, for as a result of the incessant strife and warfare, the nation had attained a very high degree of civilization. In education, military matters and commerce in general, necessity had taught them severe lessons which helped and forced them on to a very high level of intelligence.

It was then that Lao-tsze 604, Confucius 551, and Mencius 372 and a host of other great intellects throve. The Chinese look upon this period with similar feelings to the admiration we have for ancient Greece and Rome.

The next period, 220—204 B.C., though short, was of the greatest importance for the development of the empire as an empire, for one of the contending States—the State of T'sin had become so powerful that it gradually conquered all its neighbours with the result that in 220 B.C. the head of this State imposed himself as sovereign ruler over a re-united China, and reigned under the title of the first Huang-te or first Emperor. Quite apart from the barbarism, strength and unscrupulousness of this T'sin tribe, which alone enabled them to maintain their sway over the country, the following factor proved a powerful ally without which they could hardly have succeeded to the throne at all.

Civilization, as I have indicated, had reached a high level, but the great masses of the country—the peasant class who were the backbone of the army—had become more and more dissatisfied with the continuous unrest and suffering due to constant invasion and the tyranny of their local nobility, and were quite ripe for some powerful central authority which would have the power to enforce peace and to preserve them from being too unscrupulously exploited by their local princes. This year therefore brought to a conclusion China's period of provincialism, and the empire was divided into thirty-six provinces. We must not leave this period without touching upon the extraordinary constructive and destructive work of the first Huang-te. He considered himself and his achievement so great, that he determined that posterity should be made to believe that China was created by him. He it was who all but destroyed all evidence of China's existence before his time by the ruthless persecution of the literary classes and the wholesale destruction of their work, which already at that period (two centuries before the beginning of our era) was very ancient. He did many good and great things for his country, such as the consolidation of the empire, the building of the renowned Great Wall of China, the construction of various fine roads and canals, but instead of posterity holding his name in esteem, every educated Chinaman curses his memory owing to the monstrous destruction of their priceless literary records. Huangte's reign was but short, and his successors were not equal to the task of holding together the many states constituting the empire. But a man—a fine soldier and organizer—arose from the very peasant class which had brought the Chows into power, who in 202 or 206 B.C. founded the famous Han dynasty, which lasted till 25 A.D. Native maps of this period show the spreading of the Empire to the south and west, for modern Yunan, Szechuan and Canton were added. The founder, Liu, made use of the very reverse methods of the previous reigning clan, particularly with regard to literature, which plays so important a rôle in China. With a view to improving the administration of the country, he divided it into 103 provinces. Peace was at last enjoyed for many years,

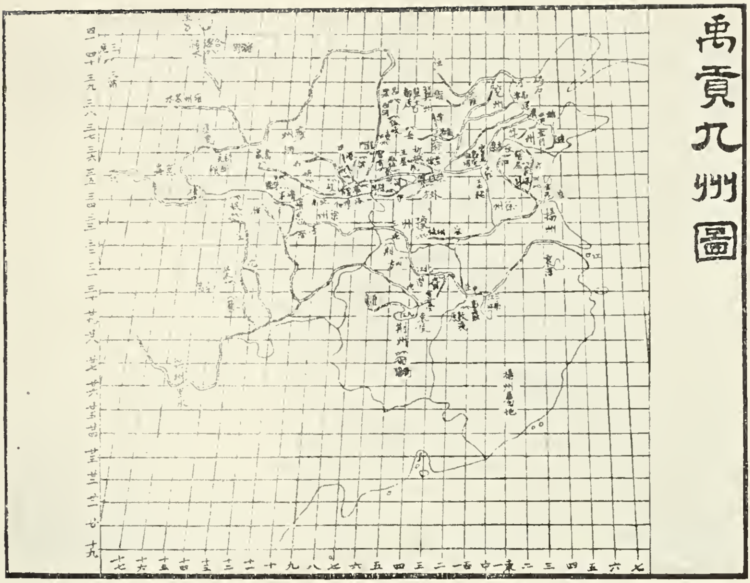

Fig. 1. Map of China during the time of Yu the Great, and of the Hsia Dynasty: circa B.C. 2205 to B.C. 1818. Capital at Yang-Hsia, near Modern T'ai Kang Hsien, in Honan.

Provinces or Chow.

K'e Chow.
Ts'ing Chow.
Yen Chow.
Hsu Chow.
Yu Chow.
Yung Chow.
Leang Chow.
Ching Chow.
Yang Chow.

which enabled the people to prosper. This period is famous, in the first place of course, because the people took the name of the dynasty, and to this day in many of the northern provinces call themselves Hanjun—men of Han. Then that peculiar institution was started, which alone entitled men to occupy positions of importance in any official line of life in China—the competitive examinations. China's present penal code is based on the first one she had—that drawn up under this dynasty. Buddhism first appeared in China during that period.

We may skip the Eastern Han dynasty from 25 A.D. to 220 A.D., for it has left no landmarks, but the memory of the succeeding period, called the Epoch of the Three Kingdoms, is kept very green, not only in China, but by Japan and other neighbouring countries. This is the chivalrous and romantic period of Chinese history; the tales of whose heroes are kept alive by numberless fine works. The empire was cut into three parts, each governed by a separate dynasty, but notwithstanding this, the Chinese influence continued to spread further south and west. Continuous warfare between the three produced its inevitable result and in 265 the Chin Dynasty was founded.

The system of administering the different parts of the empire adopted by the Chinese obtains to this day. They divided the country into nineteen provinces with civil governors. Meanwhile the Tartars, who had never ceased making tremendous inroads into China, notwithstanding the Great Wall—overran the entire northern portion of the empire and established their first dynasty in China proper, namely the Wei dynasty (386—532). The south was split up between two other Chinese clans (420—501). It will not be necessary to illustrate the extension of these states. We may also skip the period of 581—618 during which the Sui dynasty reigned. But this brings us to a most important epoch and one of China's most notable periods. The T'ang dynasty reigned for nearly three centuries, until 907. After a very long lapse China was once again restored to complete peace, and the country quickly became very prosperous. The empire was indeed extended both eastwards and westwards and incidentally Korea was conquered. Other points which make this period memorable were the many famous poets, the introduction of Mohammedanism and the erection of the famous Nestorian tablets commemorating the visit of the first missionaries to China.

In the same way that the Han dynasty 1,000 years earlier became a term for indicating north country Chinamen, so the T'ang dynasty gave its name to southern Chinamen.

The next period—an anarchical interregnum—requires no mention beyond the statement of the extremely important fact that printing was then invented in China—that is to say 500 years ahead of Guttenberg.

A famous soldier founded the Great Sung dynasty, which lasted from 960—1126. The first rulers of this dynasty made it their duty to consolidate their rule by far greater centralization of power in the Central Government. They, for the first time in Chinese history, beat and conquered an important Tartar State, namely, the Liao Kingdom. This period is famous for its philosophers; a matter of interest is that one of them, Wang-on-Shih, whom posterity has marked down as a red-hot socialist, made the first and last temporarily successful attack on the doctrines of Confucius. The Tartars, or Kins, had meanwhile prepared to avenge their recent defeat, and they suddenly overran the country and forced the Sungs to divide the empire in two, with the Yangtze as the boundary. Warfare was continuous and very barbarous. The siege of one town occupied four years, which will give you an idea of the character of the combatants. By the way, it is these Kins (and not the later Manchus) who first imposed the shaving of the head and the wearing of the pigtail on the conquered Chinese. Both these dynasties were swept aside by the overwhelming raid of the Mongols under Ghengis Khan. The Great Yuan dynasty was founded by his successor Kublai Khan in 1260, and it endured until 1341. This is the period during which Marco Polo visited and resided in China. This intrepid traveller has given us a remarkable insight into the conditions obtaining in that vast country during Kublai's reign, and I will therefore only dwell on those few features which require mention for our purposes.

Kublai lessened the number and increased the importance of the provinces: he split the country into ten divisions. He was a very wise ruler and he showed his fine intelligence in appreciating the inferiority of his own people's civilization, and the superiority of that of the Chinese, by keeping in force the existing Chinese laws. He was a great warrior too, and undertook campaigns against some of his most powerful neighbours regardless of distance. For instance he endeavoured

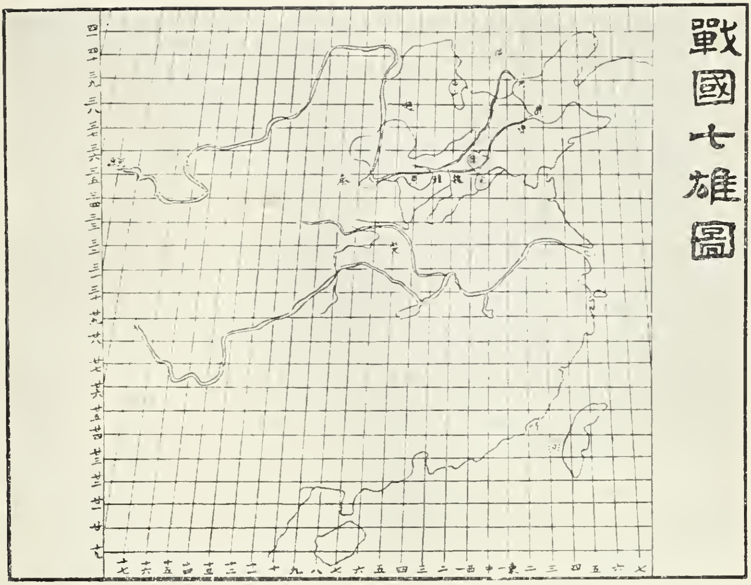

Fig. 2. Map of China during the period of the Contending States. B.C. 475 to 255 or 249. Capital Lo-yang in modern Ho-nan.

State of Tsoo.
State of Ch'in.
State of Chao.
State of Yen.
State of Han.
State of Ts'i.
State of Wei.

The two other small States of Sung and Wei lost their independence in B.C. 405 and B.C. 413 respectively.

to conquer Japan but failed, and was not much more successful in his campaign against Annam, but he succeeded in subjecting Burmah. He it was who first selected Shuntien—modern Peking— for the capital of the empire.

After Kublai's death, the native Chinese missed his firm rule and grew restive under the vicious oppression of his successors, and finally broke out in open revolt and drove the Mongols right out of their country. The leader of the Chinese forces—which drove out the Mongols—a Buddhist priest Hung Wu by name (1368–99), became the founder of the Great Ming dynasty, which reigned from 1368—1628. This pure Chinese dynasty started most auspiciously, for Hung Wu was a capable and conscientious ruler. It is quite conceivable that Andrew Carnegie drew his inspiration from him, for he presented each large city with a library. Yung-lo (1399—1425) was a younger son and never intended for the throne, but after his elder brother had died and his father had appointed a favourite nephew his heir, he fought his way there. This is another of the men who wished his name to go down to posterity in large letters, and in particular as the direct heir, so he issued an edict commanding that his predecessor's reign (four years) should be obliterated from the annals and added to his own. His tomb remains one of the sights of North China. A magnificent carved Pailow of white marble marks the approach to the Valley of Tombs. The Mings increased the number of provinces to fifteen and repaired the Great Wall of China. But notwithstanding this latter safeguard the Tartars remained a standing menace to the country and war was carried on almost without a break. During the Ming Period—Tonquin, which had been a Chinese province for a decade was surrendered; the Japanese successfully raided parts of the country to the south-east, and last but not least the Manchu troubles started. In 1516 the Portuguese arrived in China, and in 1573 the first Jesuit missionaries entered the empire (the English did not arrive until 1635). The Tartars finally fought their way to the capital, and the last of the Mings, rather than abdicate, committed suicide. As we all know, the Manchus were then called in to liberate the country of the northern scourge. This they successfully accomplished, and then calmly proceeded to gradually make themselves masters of the entire empire. It took them forty years but they succeeded.

This brings us to our last map which shows you China during the Manchu dynasty, which was founded in 1616 and came to an end February 12th, 1912. The provinces were increased to 18 during this period. I shall deal as quickly as possible with this dynasty too, but am obliged to touch upon various important points. There are but three matters that require mention in regard to the first Manchu Emperor. It was in his reign that Manchu garrisons were quartered in all important cities and centres of the empire on account of the many local rebellions. He too it was whose officers drove the Dutch out of Formosa where they had hoped to secure a permanent colony. And lastly, the first two official European embassies arrived in China with the object of opening diplomatic relations (1656). K'ang Hsi (1661—1722), the second Manchu, and Ch'ien Lung (1735—1796), the fourth, were the pick of this dynasty. There is no doubt that during their reign China enjoyed a very high position in the world. They conquered Formosa and imposed Chinese authority in Tibet. Ch'ien Lung actually annexed parts of Burma and parts of several Central Asiatic states; he even beat the fiercest and bravest race of our present Indian empire—the Goorkhas (Nepal). They recovered most of the territory that was lost under the Mings, and the empire was nearly equal to that when Kublai Khan reigned. It was during the sixth Manchu reign (Tao Kwang) that the European powers first seriously attempted to force the Chinese against their will to open their country to foreign traders and official representatives. In 1839 England entered on her first war with China, which brought in its train the gradual opening up of that country to foreign trade by means of Treaty Ports. Two years later Hong Kong was leased to us Between this and our second war (1857) with China, came the terrible T'aiping Rebellion (1850), which devastated various of the Yangtze provinces and lasted fourteen years. The defeat of an English naval force in 1859 by the Taku forts led to the Franco-British war against China, the result of which was the establishment of the Tsungli Yamen—a sort of irregular Foreign Office, which was to facilitate official intercourse with foreign nations, but in practice acted as an obstruction. From then onwards things went from bad to worse for China. The reign of Kwang Hsü (1887), the last but one Manchu, was purely nominal, for Tzu Hsi, the Empress Dowager, really held the reins of government and administration, and was supreme in power. Her per-

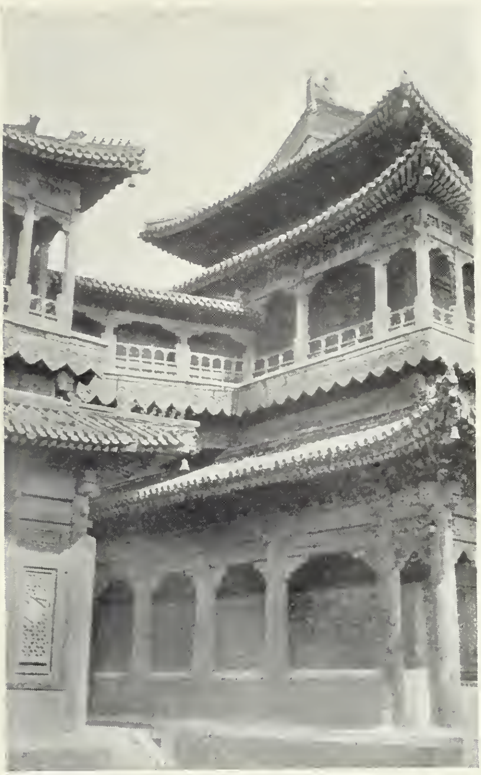

Fig. 3. China. Peking, Corner of Llama Temple.

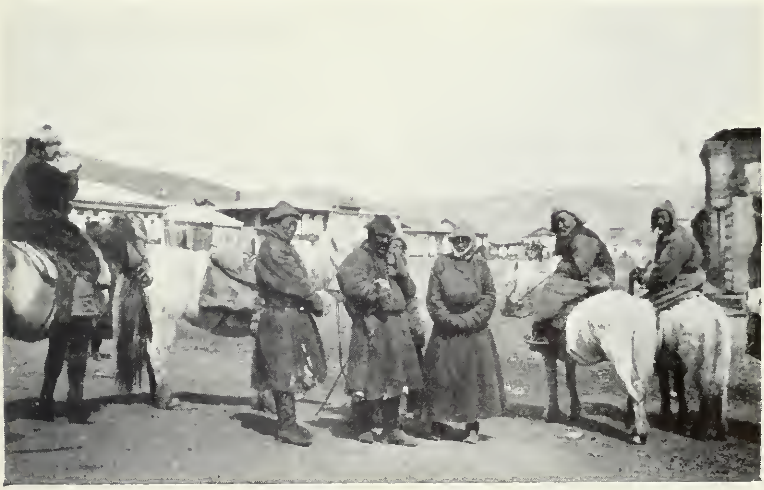

Fig. 4. China. Mongols.

sonality was indeed a most remarkable one; she was a born ruler and had great strength of character. She had her faults, but she had very great qualities too. She was pluck and determination personified.

During this period the empire met with a series of disasters which all worked in one direction, namely, the breaking-up of the prestige and power of the Manchu rulers. They finally became quite impotent: on the other hand the foreign nations grew ever keener and more grasping. It is indeed strange that the beginning of all China's serious troubles with foreign nations was unquestionably due to a piece of bungling by two of her most famous sons--Li Hung Chang and Yuan Shi Kai, the former—who although in many directions disreputable and unreliable—did wonders for the good of his country: the latter—but we shall hear plenty about Yuan Shi Kai later on.

In 1894 war broke out between China and Japan over Korea. China was badly defeated, and it cost her the very valuable islands of Formosa and the Pescadores. Under the joint pressure of Russia, France and Germany the Liaotung Peninsular was returned to her. But this disastrous war cost her indirectly just as much as the Japanese secured directly. As a *quid pro quo* for their very questionable services in connection with Port Arthur, the Russians were allowed to build the Siberian Railway through Manchuria to Vladivostock and Mukden; the French secured an important railway concession in Kwangsi; and the Germans waited their chance which came in 1897 when they occupied and fortified Kiaochow as nominal compensation for the murder of two German missionaries. They thereby secured a firm hold on the province of Shantung. The immediate result of this last stroke meant a further blow to China, for Russia occupied the recently evacuated Port Arthur, France took Kwangchow Bay in Kwantung, and England bagged Wei Hai Wei. Things were looking serious for China when means were discovered to stay further loss of territory—many more ports were thrown open as Treaty Ports, and this had temporarily the desired effect. Just about this period the young Emperor Kwang Hsü lost by death his most able adviser Prince Kung, to whom I have already referred; and the so-called reformers, K'ang Yuwei in particular, succeeded in winning the Emperor entirely over to their cause with the result that reforms and changes were initiated all over the Empire. The "old buddha," as the

Empress Dowager was called, hated reform (at that time) like poison, and by what is now known as the *coup d'état* of 1898, she robbed the young Emperor of the last vestige of authority. She enforced reaction of the most determined character, and serious trouble with foreigners soon began again. A vast anti-foreign movement spread over the country—the avowed intention being to drive the foreigner into the sea and rid China for ever of what was considered her worst enemy. This culminated in the Boxer rising and the siege of the Peking legations. The poor little Emperor did his best to stop the outrages committed, but quite in vain. You may qualify the action of those Chinese who took part in the rising as barbarous and outrageous, but there remains not a vestige of doubt in one's mind that taking all circumstances into consideration, the provocation was so extreme as to make one clearly understand that the motives underlying the rising were justifiable. Unfortunately the whole movement was misdirected, otherwise the Manchus should then already have been driven from power. We all well remember the incidents of this episode; the outcome was a crippling indemnity to the Powers who took part in the relief of the Legations and the destruction of the Taku forts. China suffered a further loss in this quarter later on—Chingwantao—the winter port was made into neutral territory. The sea freezes for several miles out from land at Taku and renders navigation impossible during the winter months. It freezes at Chingwantao also, but steamers are able to work their way through the ice cakes, which are probably distant relatives of those Dr. Charcot showed us a few months ago. A further result of the Boxer troubles was the installation of the Wai-wu-pu, whereby at last a proper ministry of foreign affairs was established.

The Russo-Japanese war, which was nominally fought in China's interest, cost her Manchuria to all intents and purposes—the north to Russia, the south to Japan—and her last hopes vanished as to the recovery of Korea and Port Arthur with hinterland. During the same period China almost lost Tibet at the other extremity of her empire. The Anglo-Japanese alliance again put a temporary stop to any further loss of Chinese territory.

1909 saw the final acts of the break-up of Manchu power. The young Emperor and the Empress Dowager both died. A

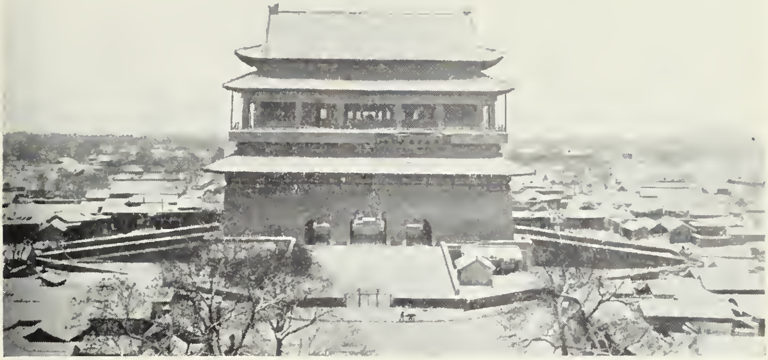

Fig. 5. China. Peking, Drum Tower built by the Mongols.

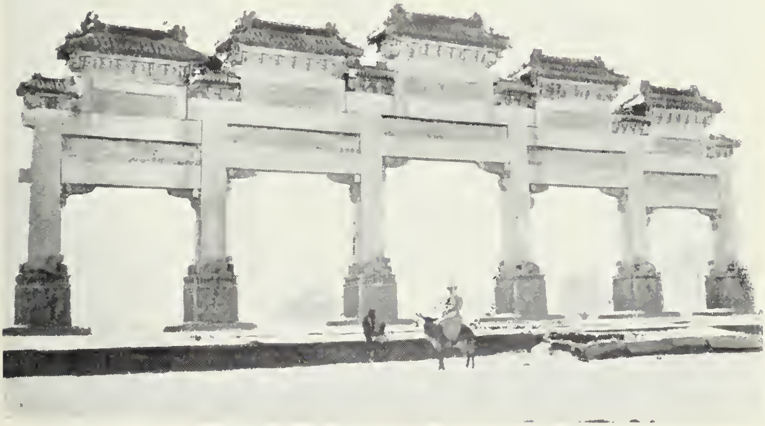

Fig. 6. China. The White Marble Pailow at Nankow.

baby became ruler and there was no Tzu Hsi to fight his battles.

The ever-growing ranks of the reformers—mostly students educated abroad—became more restless and irrepressible. The constant indignities which their country was made to suffer disgusted them and incited them to clamour for reform of the Government. We find the first fierce stand against this danger taken by the Empress Dowager in 1903 when she had a number of them beaten to death (Shen Chin, &c.).

In 1906 Sun Yat Sen formed the famous Students' Association. I should mention that Dr. Sun Yat Sen is 45 years old and has been an agitator for reform nearly his whole life, his ideal being the regeneration of China. He has been obliged to live outside China for many years, for the Manchus realized his great powers and set a price on his head. Nor would they let him spread his propaganda abroad, and you will doubtless remember the sensational attempt in 1897 by the Chinese Legation in London to kidnap him. Dr. Sun Yat Sen is universally considered the personification of modesty and unselfishness.

1907 produced the first real sign of weakening on the part of the Manchus, for provincial assemblies were instituted, but with powers so limited as to muzzle them completely. This did not satisfy the reformers for long, and they soon greatly exceeded the authority granted them. Incidentally too they started the stirring up of the country at large by means of newspaper propaganda. In 1908 the Manchus agreed to consider some sort of a constitutional system to come into practice in nine years. Early in 1909 a small rising took place which was, however, quickly stamped out. Shortly afterwards a momentous incident occurred; Yuan Shi Kai was dismissed from office and returned to his home nominally to nurse his sore big toe. At this juncture it will be advisable to give you an insight into the past of this great man on whom so much depends. He was born in 1858 and is therefore 54 years of age. He owes his great advancement both in early and later years to the protection of Li Hung Chang, from whom he quite conceivably acquired certain questionable qualities and characteristics. He is remarkable in more ways than one, for he has acted both as a curse and a blessing to his country. There is no doubt possible that the beginning of all China's greater and later troubles are traceable to her war with Japan over Korea.

This war would never have broken out had it not been for Yuan Shi Kai. Then in 1898, after years of good sound work in the interest of education and reform, he suddenly turned right round and helped the cause of reaction. Incidentally the worst blot on his career occurred in connection herewith; and explanations on his part have failed to remove it: he betrayed the trust of his master, the young Emperor—a crime for which he has not yet been forgiven, nor is there much likelihood that the moral effect thereof can ever be forgotten. Indeed his discharge from office to which I have just alluded is directly traceable to Prince Ch'un, brother of the late Emperor, the recent Regent. On the other hand Yuan Shi Kai's attitude and activity during China's next great crisis—the Boxer troubles in 1900—goes to the credit of his account. Finally his splendid work in more recent years as Viceroy of Chihli, when he reorganised all military institutions and created a really efficient and fine army, redounds to his credit. You can therefore easily understand how it is that neither Chinese or foreigners trust Yuan Shi Kai completely. That he is a great personality and capable of the very finest achievements no one doubts, but his past militates against one's belief in his absolute integrity. But even his severest critics admit that he has done well—marvellously well—for China during the present upheaval. To return to the year 1909, we find that towards the end of that year (October 24th) the two provinces Hupeh and Hunan urged the Manchus to establish a parliament without delay and not to wait nine years as proposed by them. During 1910 the sixteen other provinces joined in this demand, and the combined representation actually brought about the establishment of a National Assembly (October 3rd).

We now come to a point where European interests enter. Both Hunan and Hupeh are very anti-foreign, but it was in Szechuan that the Tong Chi (anti-foreign loan Society) was formed, whose definite aim it was to frustrate the Central Government's policy of development of the empire by means of foreign capital, and in particular to stop the nationalization of railways. They actually managed to stop one great loan from being contracted, which had been intended for currency reform.

Another secret society, the great Canton Ko Min Tang, worked hard and recklessly in the same direction. Many of their members paid for their service with their heads. This question of loans to China had gradually become a difficult and dangerous one. Those far-sighted Chinamen who realized how greatly their country was bound to benefit by the influx of foreign capital, were opposed by that class which felt that it merely indicated the further spoliation of their country. As far back as 1907 European and American bankers had established the principle of not making further loans to China for unproductive purposes (such as Army and Navy) but solely in order to remedy the existing financial chaos. This is a most interesting subject, but time prevents me from enlarging on it. It is, however, necessary to allude to it, for it acted as the last straw, inasmuch as the student class which fomented and worked the revolution made use of these foreign loans as an excuse for their revolt.

The Central Government were evidently beginning to realize that a general upheaval was imminent, for they desperately endeavoured to remedy the situation by means of the intervention of various powerful native Chinese personalities, such as Yuan Shi Kai, Tang Shao-yi, Sheng Hsuan Huai, etc. When Yuan Shi Kai was removed from office early in 1909 he was to all intents and purposes master of the empire by reason of his foreign trained army of over 70,000 men which he had brought up to a high pitch of efficiency. There is no doubt that although the chief reason of Yuan's disgrace was vengeance, the Manchus had grown afraid of his great power. A year later they were on their knees beseeching him to return to office. I don't know that I have much right to state this view, but the more I have studied this question the more I become impressed with the fact that there must have been some what one may call hanky-panky going on behind the scenes. I may be mistaken, but I cannot help but associate the fact, that from the time of Yuan's retirement, the cause of reform grew enormously in daring and persistence, and as Yuan's return to power was entirely dependent on his indispensability to the throne, it is quite conceivable that he was pulling the wires beneath the surface. A peculiar factor which has helped to impress this upon me is that when Sun Yat Sen sailed from London to return to China he secretly held the authority of seventeen provinces. That is proof conclusive to me that the revolutionists had a definite plan and aim, in contrast to the general assumption that the revolt gathered way as it went along, developed into a revolution and shaped its course according to opportunity. To revert to the course of the revolution, Yuan refused repeatedly to come to the assistance of the Manchus—he was quite obviously sitting on the fence. Meanwhile in the beginning of September 1911, a revolt broke out at Chengtu, the capital of Szechuan. The government were unable to suppress it. A little less than a month later the rebels had captured the all important Hanyang arsenal, adjoining Hankow. Here they secured ample war material—guns, cannon and ammunition. They then bombarded and looted Wuchang on the opposite side of the Yangtze. On this very spot and all along this road the Manchu garrison met its fate; they were massacred almost to a man. The streets were turned into mere shambles. One day later the so-called Reformed Government was proclaimed under General Li Yuan Hung. This very efficient and modest officer, whose past is quite obscure, but who has a great future, played a very important part in the revolution. Hankow native city was then stormed and taken. At this juncture the Manchus appointed Yuan Shi Kai as Viceroy of the provinces in revolt, and ordered him to re-establish the Imperial authority. He again declined the honour. A few days later many other large cities such as Changsha, Ichang, Kiukiang, were taken by the rebels. Gradually, however, an imperial army despatched in haste to the south to reinforce the small force that had remained loyal to the Manchus, began to dispute every yard of ground with the rebels, and by the end of November finally succeeded in recapturing the Hanyang arsenal and also all that was left of Hankow. They owed these successes principally to dissensions among the revolutionists and to differences between the leaders of the various provinces. On the other hand Nanking was taken by the rebels in the beginning of December, after a desperate fight, the revolutionists distinguishing themselves by great daring and courage.

About this time a disposition to treat was manifested on both sides, and a three days' truce was agreed upon as a beginning, which later on was prolonged. On December 6th the Regent-Prince Ch'un resigned his office. This marks a further step in retreat on the part of the Manchus, besides savouring of an act of revenge of Yuan Shi Kai's, who had at last made up his mind to take an open hand in the game. A provisional government was then formed in the south at Wuchang, and another in the centre at Shanghai—the definite outcome of which was that Dr. Wu Ting Fang, an eminent diplomatist, was authorized by the revolutionists to represent them at the proposed Peace Conference at Shanghai, which was held under the auspices of a highly respected Englishman, Mr. E. S. Little, a resident in China of many years' standing, who commanded the confidence of both Imperialists and Revolutionists. Tang Shao Yi—likewise an eminent diplomatist—was appointed delegate of the Imperial party. One of Tang's greatest achievements was his very large share in the work resulting in the partial abolition of opium in China.

Unstinted praise and admiration are due to the organizers of this Peace Conference, for the difficulties arising from jealousy, misunderstanding and deliberate obstruction were enormous.

In order that you may appreciate the points at issue, I will read you the report of an interview Dr. Morrison had with Yuan Shi Kai at that period, December 15th. Dr. Morrison, as you no doubt know, is probably the greatest living European authority on modern Chinese politics.

> " This afternoon I had the privilege of a long conversation with Yuan Shih-kai. I found him in excellent health and full of courage, realizing the seriousness—almost hopelessness—of the task with which he is confronted, but determined to spare no effort to re-establish a stable Government and to preserve the country from disintegration.
>
> With this object he is advocating the retention of the present dynasty as a limited monarchy, fearing, if the demands of the Republican party prevail and the dynasty is removed, that there would be internal wrangling leading to anarchy, in which foreign interests would suffer and foreign lives be endangered, and so foreign intervention and partition would follow. Already, he says, there are signs of dissension among the revolutionaries. Each province has its own objects and aspirations. The view of the north cannot be reconciled with that of the south. Their aims are widely divergent.
>
> I suggested that the revolutionary movement was a protest against the weakening of China, against the impairment of her sovereign rights, and against the corrupt influences of a decadent Court, which had involved the empire in disaster after disaster; that the forces of the revolution were directed

towards increasing the strength and solidarity of the empire and the people, not towards disintegration.

The Prime Minister repeated his fear of the instability of a rampant democracy, of dissension and partition. He thinks that the retention of the reigning family, deprived of all power to renew the misgovernment of the past, retained only as an emblem of monarchy, would be a bond that would ensure the integrity of the empire.

I suggested that we had to face facts; that no fact was more insistent than the determination of a large number of the best provinces of China to consent to no form of compromise which permitted the retention of the present dynasty. I suggested that it was difficult to understand how the retention of an unpopular dynasty, so unfitted to rule as the present dynasty, could be a unifying force; it must inevitably be a disruptive influence.

The Prime Minister questioned the correctness of this view. He said he had studied China closely, especially during the last three years when in retirement. He believed that seven-tenths of the population were still conservative and satisfied with the old régime; three-tenths only belonged to the advanced party. If the revolutionaries should succeed in overthrowing the present dynasty, another revolution might take place, headed by the Conservatives, having for its object the restoration of the monarchy. Amid such chaos all interests would suffer, and for several decades there would be no peace in the empire.

I suggested that a limited monarchy, as in England, was an ideal form of government, but that our monarchy was in the hands of those who could be trusted, whereas in the case of the Manchu monarchy the fact could not be disputed that it was enormously distrusted.

He said the throne could not and would not attempt to evade the promises given on October 30th, and that next Friday the Regent would swear before the altars in the Temple of Ancestors that the throne would be faithful to its promises.

Then I spoke of the movement of which I telegraphed yesterday. The whole object is the voluntary withdrawal of the Court to Jehol pending the assembling of a national convention to ordain what form of government China shall

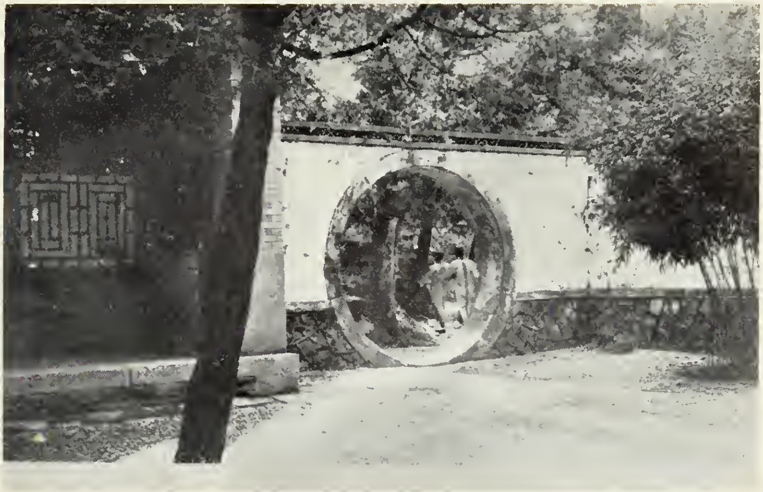

Fig. 7. China. Courtyard of Summer Palace at Yuan Ming Yuan.

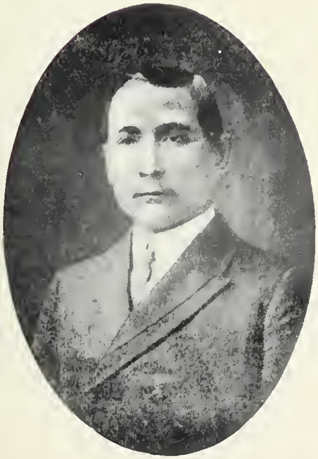

Fig. 8. Dr. Sun Yat Sen.

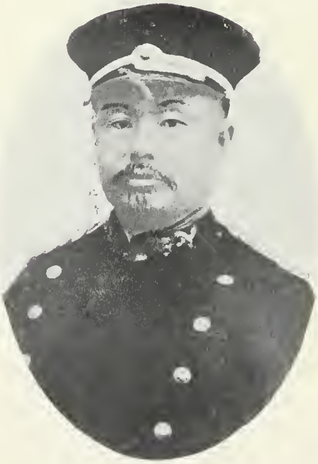

Fig. 9. General Li Yuan Hung.

> adopt in the future, whether a limited monarchy or a federal republic.
>
> Yuan Shih-kai admitted that the scheme had been submitted to him, that it was supported by many reasonable men and could not be dismissed lightly, that for a week past he had given it constant thought, and that the question was still under consideration. What he fears is that the premature departure of the Imperial family might create unnecessary panic and cause the very bloodshed which he hopes will be avoided.
>
> I was tempted to ask, but refrained, whether the hoisting of the revolutionary flag by all the ships lately under the command of Admiral Sah Cheng-ping, who is himself a refugee, and their bombarding of the Imperialist troops at Hankow would influence the judgment or the fears of the Regent."

That gives you an excellent insight. You at once see the two definite standpoints. The revolutionists wanted nothing more nor less than a clean sweep and the establishment of a Republic, and Yuan Shi Kai held a limited monarchy to be the only solution.

On December 22nd the Peace Conference began, and the immediate result was that the delegates of both sides agreed that no further meeting of the Conference should take place until both the Peking and Wuchang generals undertook to stop all fighting pending the deliberations of the Conference. These assurances were forthcoming at once. An armistice was agreed upon. The only definite result, however, was a proposal for a National Convention to be convened to sit at Nanking and decide upon the future government of China.

Meanwhile Dr. Sun Yat Sen arrived at Shanghai (from England) and was immediately proclaimed head of the revolutionary party. He proceeded to Nanking and established the Provisional Republican Government, being elected unanimously to the Presidency.

After the failure of the first Peace Conference, the danger of a split between north and south was great. A republic versus a limited monarchy remained of course the main outstanding difference; but meanwhile the questions of capital—Nanking versus Peking and Sun Yat Sen versus Yuan Shi Kai for supreme power—widened the breach.

On January 16th of this year an attempt was made on Yuan's life by means of a bomb; his assailants fled into a tea-house and were caught. It was indeed fortunate that Yuan escaped, for he was and is absolutely necessary for the peaceful transition period of China. No other personality could replace him and save China from disruption. After protracted negotiations between Dr. Sun Yat Sen and Yuan Shi Kai, which several times almost ended disastrously, an agreement was reached. On February 12th the throne abdicated. Three Imperial Edicts were issued, the gist of which was:—

1. The throne accepts the republic.
2. The throne accepts the conditions offered in connection with its retirement.
3. The throne states it is retiring from political power to meet the people's wishes and to restore peace, and it instructs the provincial officials to maintain order.

It is hard, in fact almost impossible, for us to appreciate this Act of Abdication in its true light. It is all the more remarkable for the fact that the actual fighting was very limited in extent. There is no doubt that the liberality shown by the revolutionists in their settlement as to the allowances to be made to the Manchus on their retirement greatly helped to settle matters. It meant of course a great victory for the revolutionists to force the most absolute monarchy in the world to lay down its power.

No sooner was the edict made public than a manifesto was issued appointing Yuan Shi Kai the fully empowered organiser of the republic. This announcement almost brought north and south to loggerheads again, for the Provisional Government at Nanking refused to recognise Yuan's appointment either by the Emperor or by himself—maintaining that no power but their's could make such an appointment. Yuan was requested to come south and take the Oath of Allegiance to the republic, share the deliberations of the Provisional Government and await the decision of the Assembly as to an appointment. Yuan endeavoured to demonstrate to Nanking that his presence in the north was imperative, in order to enforce order, and that in the country's interest he dare not leave Peking. At the same time he confirmed his adherence to the republic. On February 14th Dr. Sun Yat Sen resigned his position as President of the Provisional Government. I give here the translation of his letter of resignation to the Assembly. It is characteristic of

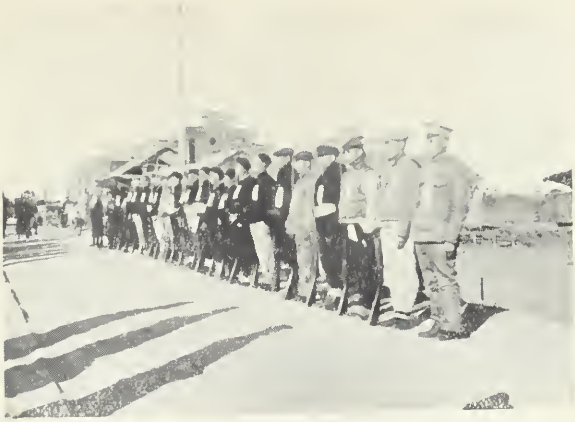

Fig. 10. China. Recruits for the Revolutionary Cause.

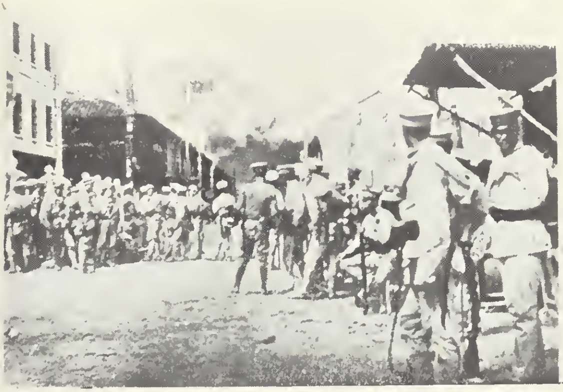

Fig. 11. China. After the Storming of Hankow.

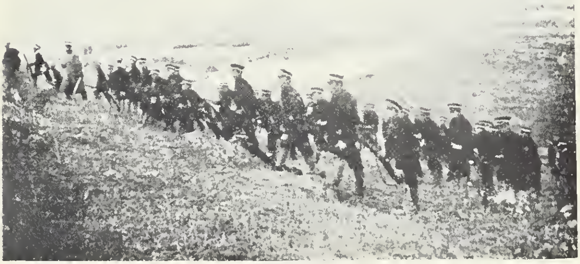

Fig. 12. China. The Attack on Nanking.

the man, showing as it does his lofty mind and nobility of purpose:—

> "To-day I present to you my resignation and request you to elect a good and talented man as the new President. The election of President is a right of our citizens and it is not for me to interfere in any way. But according to the telegram which our delegate Dr. Wu was directed to send to Peking, I was to undertake to resign in favour of Mr. Yuan when the Emperor had abdicated and Mr. Yuan had declared his political views in support of the republic. I have already submitted this to your honourable Assembly and obtained your approval. The abdication of the Ching Emperor and the union of the north and south are largely due to the great exertions of Mr. Yuan. Moreover he has declared his unconditional adhesion to the national cause. Should he be elected to serve the republic, he would surely prove himself a most loyal servant of the State. Besides, Mr. Yuan is a man of political experience, upon whose constructive ability our united nation looks forward for the consolidation of its interests. Therefore, I venture to express my personal opinion and to invite your honourable Assembly carefully to consider the future welfare of the State, and not to miss the opportunity of electing one who is worthy of your election. The happiness of our country depends upon your choice. Farewell."

On a more recent occasion he said:—

> "I wish that a lasting peace may be established between north and south. When I return to private life, I shall be a citizen as one of you and shall try to further the best interests of the republic to the utmost of my power."

We must all agree that his example of self-sacrifice and purity of purpose is superb. There is no room for doubt that it is solely due to his unselfishness and modesty that the north was won over.

A day later—February 15th—Yuan Shi Kai was elected President in his stead. The representatives of seventeen provinces took part in the voting, and on the strength of Dr. Sun Yat Sen's recommendation the election was unanimous. On February 20th the man who had cheerfully shouldered the lion's share of the fighting, General Li Yuan Hung, was unanimously elected Vice-President, and later on Tang Shao Yi was elected Prime Minister. You have already made their acquaintance. But one step still separated north from south, on the surface a mere matter of form, but in reality treacherous quicksand. The Nanking authorities could not see their way after all to reconcile themselves to Yuan's apparent inability to leave Peking to come to Nanking. They insisted that his visit to Nanking was essential. Yuan finally gave way against his better judgment and announced his intention of going south for the Presidential Inauguration Ceremony. No sooner was his decision made public than it bore foul fruit. Both troops and populace broke loose on the slightest indication of the withdrawal of the master hand. Looting and sacking became general in Peking and spread to other large Northern cities.

Nanking then realized the bonafides of Yuan's objection to leave the north, even temporarily, and released him from the southern journey, agreeing to send their delegates to Peking to attend the inauguration ceremony there. The rioting was then put down with what we may call a *very* firm hand. We must not be surprised, by the way, to hear of outbreaks and risings here and there over that vast empire. Many of the northern regiments had seen no fighting at all, for the only serious warfare had been in the south and only a portion of the northern army had been sent south. These men were simply spoiling for a fight and keen on loot; hence when the republic was definitely declared and peace restored, they realized that they had not been in at the fun at all, and in their bitter disappointment got temporarily out of hand. Their rioting quickly incited the populace with the inevitable result that many lives, much property and treasure were wasted and sacrificed.

There remains but one act to be decided upon before the curtain can be rung down on this wonderful drama—that is the decision as to whether Peking or Nanking shall be the seat of the Government—we need not discuss Wuchang's and Tientsin's chances. This is a very vexed question, and there is no doubt that the southerners' claim that the capital of the republic should be Nanking is more than justified. In the first place comes the fact that Nanking lies much more in the centre of China, and is therefore in better touch and sympathy with the empire than Peking which lies on the very outskirts. Then

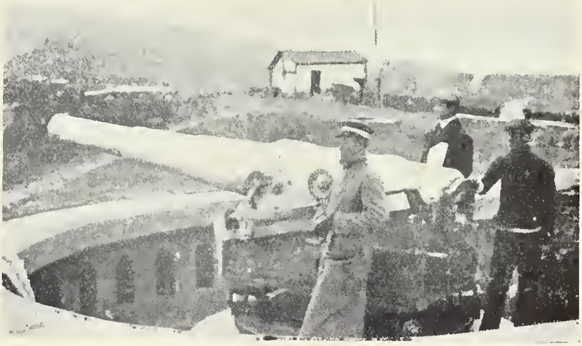

Fig. 13. China. Big Gun captured at Nanking by the Revolutionists.

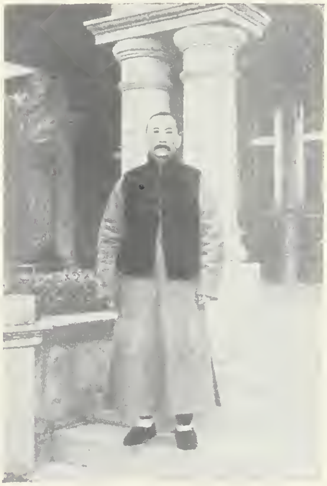

Fig. 14. Tang Shao Yi.

it cannot be denied that Nanking would mean a clean fresh start, in a place where the Republican Government would be entirely uninfluenced by its surroundings—whereas Peking traditions and associations, quite apart from possible Manchu interference—might have a very bad effect on the government. There is just one other reason which is maybe the most important—the reformers consider that the *moral* effect of change of capital would be great, and that in fact it is due to them as part of their victory.

I have purposely not alluded to the numerous side issues, and the various minor revolutions within the one great one, which gradually spread to every district of this huge empire. The country at large was terrorised by bands of robbers, and the rivers by pirates. Lawlessness made far too rapid headway; the normal life of the nation, industry, commerce and agriculture came to a sudden standstill. Financial chaos reigned.

We now come to another important matter. It is necessary to appreciate the true character of Chinese feelings and attitude towards foreigners. The study of the official intercourse which existed between China and the European Powers proves that the basis was a very peculiar one. In order to be able to appreciate it in its proper perspective, you must bear in mind that China up to comparatively recent years has considered herself as the paramount State of the world and all the other nations as subjects.

All gifts from other rulers were set down as tribute: on the other hand all her gifts in return were considered as presents. Foreigners were never welcomed in China for they were neither respected nor wanted, and consequently they were not taken seriously nor treated as equals. At best they were only admitted into the country on sufferance. It was solely by incredible patience, heavy bribery and brute force that European Powers were able to gain a foothold in China at all. Europe's first diplomatic intercourse with China was mostly wrongly conducted, and England's policy was every bit as bad as that of her neighbours. The Chinese, on the other hand, have always depended more on negotiation and diplomacy to uphold their rights than on their armies, which up to 1890 were mostly armed with bows and arrows. China was more than a match for her adversaries at this game of diplomacy, which is borne out by the fact that no European Power ever gained anything by diplomacy. It was only when her antiquated war devices were opposed to modern military and naval forces that she lost heavily. Another factor that could not but have a very derogatory effect upon her feelings towards and respect for foreigners is to be found in the absolute fact that the latter frequently did not hesitate to take advantage of temporary political difficulties in which she found herself, owing either to internal troubles or wars with other nations—to secure privileges and advantages which in fair negotiation they would never have obtained. In this respect Russia is by far the worst offender. To study Russia's relations with China from their inception, which was about the time the Manchus came to the throne, right up to to-day, fills one with repulsion. For over two centuries, as one authority very rightly puts it, "any advantages or concessions the Russians obtained from the Court of Peking were flung to them as a bone flung to a dog." China defeated Russia in fair warfare and was easily able to hold up Russia's grasping hand, but from 1858 onwards Russia took advantage of every crisis in China, of every weakness to grab something, and she has been extremely successful at this disreputable game. Her latest success is of course in connection with Mongolia.

Then take Macao—the Portuguese colony in China. The status of Macao is to this day neither clear nor above-board. Did time permit us to work through the relations of every foreign nation with China you would realize how brutally foreigners have dealt with China in order to gain commercial and political advantages—and China has always had to submit. There is just one exception, the Dutch, the only nation China ever got quits with. The Chinese authorities never treated them otherwise than as vassals and even beggars, and then closed their account by giving them a good licking when they drove them out of Formosa.

From what I have said, you will have gathered that experience had taught all foreign educated Chinamen that foreign superiority, anyhow in the material sense, was bound to lead to continued national humiliation, and it must have been impressed upon their minds that the Great Powers were only awaiting a favourable opportunity to divide the Chinese empire. Realizing the impotence of their rulers to alter this dangerous state of things, no wonder then that every Chinaman who had learnt the meaning of patriotism, determined at all costs to do his share towards removing the helpless monarchy and replacing it by a government which should be able to reform the country in such a manner as to permit of self-respect and definite progress.

It reflects great credit on the Great Powers that in view of this well-known deep-seated conviction of all thinking Chinamen, they—the Powers—formed a ring round the combatants and observed strict neutrality, undertaking to do nothing individually but solely collectively. This is the first real evidence that China has had that she is to be allowed to manage her own affairs if she is capable of doing so.

At the same time I ought not to pass over the one indirect exception to the above—I alluded to it just now—Mongolia—in reality Russia helping herself, as usual, to a slice of China when the latter is quite unable to defend herself. The territory in question is equal to France and Germany in size.

On the other hand it reflects credit on the Chinese that one of the first decrees, if not the very first, of the revolutionists was, "Don't touch the foreigners. Don't damage their property." Particularly is this the case when one bears in mind that practically all China's troubles have been brought about by foreign intervention.

I have purposely led you through the intricacies of Chinese history coupled with the geographical aspect, for they will have proved to you that the overthrow of the Manchu dynasty became inevitable, and being inevitable, was natural. You cannot fail to have noticed how, from the outset, the independent feudal states gradually gave way to centralized power and authority, vested in an unlimited autocracy. Each dynasty in turn came to grief owing to the decadence of its ruling members and to the consequent weakening of that centralized power which manifested itself, geographically speaking, by the shrinkage—temporary or otherwise—of the country's boundaries. The hidden strength of China—latent as it is—has invariably known how to rid itself of undesirable rulers when the country was made to suffer too heavily for its monarch's faults. The result has always been the same—the violent removal of the ruling race either by foreign invasion or by a powerful unit within the country taking the law into its own hands.

There are, however, two fundamental differences between the recent upheaval and its many predecessors. Firstly, new dynasties in China's past have always tended to increase the absolutism of the autocratic government of the country—the recent revolutionists, however, now masters of the situation, have instituted a democratic government in the form of a republic. Secondly,—without exception every Chinese dynasty has been driven from power, fighting—the Manchus, however, abdicated after a very short struggle, and what is more, whilst still having a considerable loyal army at their disposal.

I should mention that not a single European, American or Japanese authority claims to have foreshadowed the coming of the recent revolution—that means a great deal—nor its character, nor when it broke out did anyone realize what its far-reaching aim was. No sooner, however, was the word republic pronounced than its effect worked like magic. To all those who have followed this extraordinary metamorphosis there is something almost uncanny attached to the incredibly quick and comparatively smooth change. What has happened is marvellous, much more extraordinary than anyone of us here is capable of realizing. We are able to explain the cause and effect to a limited extent, but beyond that we cannot get, for the ways and ideals of the Chinese are peculiar and partly incomprehensible to us. Here is a race that has lasted several thousand years, and which has consistently and successfully resisted foreign influences, turned inside out by those very influences. For this so-called reform movement which has gained the day is neither more nor less than the effects of foreign influence on those of her sons who have been educated abroad. We must not think that it is the Chinese as a nation who are changing; that would be quite incorrect. The great masses of the country, which are quite mediæval in every direction, understand as yet little, if anything, of the changes. Many of China's best friends among foreigners still maintain that a limited monarchy is the only means of avoiding a state of anarchy for an indefinite period; besides they state, and rightly so, that the progressive element in Chinese history has always been the monarchical element. There is no doubt that a monarchy, however limited, means centralized power and authority. They further argue that ancestor worship and history amount to a religion, of which the Emperor forms part, and which has enabled the empire, as an empire, to exist far, far longer than any other, and they deduce therefrom that you cannot summarily do away with the dynasty, as has been done

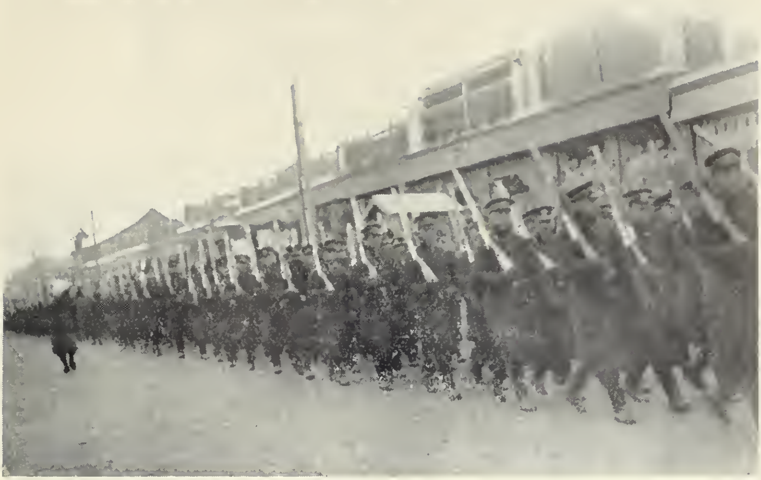

Fig. 15. China. A regiment of Yuan Shi Kai's northern troops.

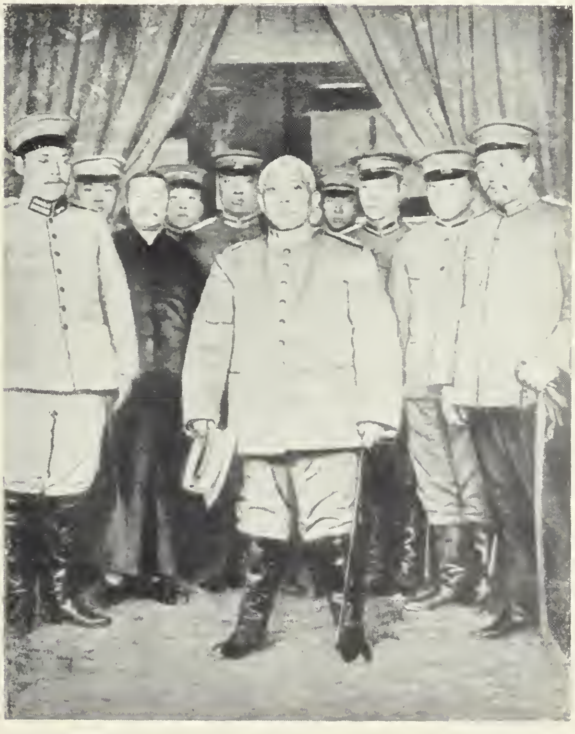

Fig. 16. China. Yuan Shi Kai and his general staff.

elsewhere under entirely different conditions. But against this argument may be cited the most interesting and important fact, that on February 15th Dr. Sun Yat Sen, the President of the Provisional Republican Government gave proof of the very contrary by visiting the tomb of the founder of the Ming—that is the pure Chinese—dynasty, and offering sacrifices in the ancient national fashion. There is therefore no intention to do away with this important factor.

The argument that the Chinese are not ripe for a republic can be easily proved to be without foundation, for the study of the exact nature of the Government of China shows that although an autocracy, it has numberless points in common with a republic; moreover in most matters affecting the everyday life of the nation, the Chinese rule themselves. To put it in a few clear words—the country is a vast democracy under nominal control of a liberal despotism.

No—where to my mind a great danger lurks, is in this query: To what extent, and with what effect is foreign learning and are foreign theories to oust her own ancient traditions and institutions? One cannot overlook the fact that the republic has unquestionably been imposed on China, the various stages of the revolution have proved that. Imposed—not only on the Manchus, but just as much on the immense majority of pure Chinese who know nothing of what has taken place. Therefore all depends upon whether the re-united provinces, as a nation, will approve of the republican form of government. That again must obviously depend whether two conditions are fulfilled to their satisfaction. Whether the government of the eighteen home provinces is satisfactory and whether the integrity of Manchuria and of the Colonial possessions, that is Mongolia, Tibet, Ili, &c., &c., can be maintained. One thing is quite certain, only a powerful centralized authority can achieve these objects, and it is equally certain that under existing conditions the republic cannot hope to attain these ends without the financial help of foreign powers. That means three things.

The republic will have to go back upon the very principles which brought about the formation of their fighting organization and resulted in their victory:—the principles of the anti-foreign loan society.

Secondly, they will have to re-introduce provincial taxation, which they abolished during the revolution in order to gain popular favour, and lastly, the provinces will have to surrender far more of their independence than they were willing to do during the existence of the monarchy. Three very tough nuts. How it will all pan out time alone can show. The republicans will soon enough realize that the first chapter of their work, terminated by the abdication of the Manchus, is of quite secondary importance, as compared with the magnitude of their future task. And here I feel obliged to allude a last time to Dr. Sun Yat Sen. He probably realized that he was not equal to the gigantic labours ahead—and therefore acting in agreement with his conscience—resigned at the height of his power, and when he was master of the situation.

Fortunately—most fortunately—they have as President a man whose qualifications mark him as the right man in the right place. He stands for centralized power in all its meanings. He may not be entirely trusted by folk with memories and consciences, but he is an absolute necessity of the present situation. The destiny of China lies in his hands, for it is now certain that he is the only man who can control both south and north. The supreme need now is peace and order, and the stamping out of all lawlessness. The present temporary coalition Government (practically a military one), representing both north and south, should be able to quickly bring this about by methods peculiarly Chinese. By the time the National Convention is convened, it is to be hoped that the best intellects in the country will have evolved the principles for a fitting Constitution.

One most promising augury for the future is to be found in the authoritative statement that that great body of men—the *literati*—who have such enormous influence in China—are in favour of the republic. The law which Confucius laid down in his day:—

> "adopt no new devices from abroad, stick to your own old ideas, ways and means"

must account just as much for the very anti-foreign and anti-reform attitude of this class as the fact that their interests were bound up in the continuation of the existing order of things. What was possible in Japan is possible in China, I obviously refer to the material reform and in no way to the government.

But quite different methods will bring about the transforma.-tion Who would have dared to prophesy fifty years ago what position Japan would occupy in the world to-day? China's resources are infinitely superior in every direction to those of Japan; no man can conceive the real possibilities of China under good and stable government.

In conclusion, the new flag of the Chinese Republic marks a step in the right direction. It is at the same time the symbol of unity for the government of the five races comprising the republic, and of the five component parts of which the world is made.

ATLANTIC TO PACIFIC, ACROSS THE CANADIAN ROCKIES.

By C. H. Bellamy, F.R.G.S.

(A Summary of the Lecture delivered to the Society on Tuesday, February 27th 1912.)

The lecturer strongly advised intending visitors to go by the direct steamer route, instead of going by New York, as there is a fascination entirely its own about this shortest and most northerly course to Canada. Your fancy is stirred, or should be, when at a certain point you know that a day's run due north would land you on the coast of Greenland, and that you are in the latitude for icebergs. Passing through the Belle Isle Strait, there is land on both sides of the steamer, on the north the inhospitable shores of Labrador, and on the south the most desolate and loftiest uplands of Newfoundland. Yet these awe-striking and inhospitable coasts were the first to make glad the heart of Sebastian Cabot when, four centuries ago (1497), the city of Bristol sent out the adventurous Genoese with eighteen English sailors to discover the North America that we take count of now. The first important exploration, as well as the first settlements, are, however, due to the French. Jacques Cartier made three visits to what are now the Eastern provinces in 1534, 1535 and 1540. Samuel de Champlain made several visits and carried on a considerable amount of exploration in 1603 and subsequent years, and in 1608 founded the city of Quebec. During the next century and a half the St. Lawrence region formed a French colony under the name of Canada, but in 1670 the English Hudson's Bay Company was founded and began to trade with the Indians in the North-West, and in 1749, Halifax, Nova Scotia, was founded, and a number of British emigrants brought out and settled in that province under a British Governor. In 1759 Quebec was taken by General Wolfe, who thereby secured the possession of Canada for the British.

What is now known as the Dominion of Canada came into constitutional existence in 1867, and at that time comprised only the four provinces of Ontario, Quebec, Nova Scotia and New Brunswick. In the course of the succeeding six years, the provinces of British Columbia and Prince Edward Island were added to the Dominion, and a new province under the name of Manitoba was carved out of the North-West Territory, and in 1905 the two new provinces of Saskatchewan and Alberta were formed, making the Dominion as it now exists to contain these nine provinces.

The lecturer only made brief allusions to Quebec, Montreal and Toronto, and then spoke of the 2,200 miles journey to Winnipeg. the first part being through a well-wooded country, with a number of little lakes twinkling with bright colours, up to Lake Superior and Port Arthur. From here to Winnipeg the railway runs through a sterile-looking wilderness of rock and swamp, of woods and blue lakes. About forty or fifty miles from Winnipeg the forests that wrap the eastern half of Canada as with a mantle, except where cleared by the settler's axe, begin to yield, and the first patches of prairie dispute with the everlasting woods the richer and more level lands over which the train runs into Winnipeg station. It is nearly one hundred years since the Hudson's Bay Company established a station at Fort Garry, which thirty or forty years ago became Winnipeg. It is the capital of the Province of Manitoba, and in ten years has trebled its population, having now over 150,000 inhabitants, and covers an area of twenty square miles. It owes its importance to the fact that it is the doorway and commercial focus of the Canadian North-West, with its boundless prospects of unexplored wealth. It has been called the "Chicago of Canada," and handles even more wheat than the United States city, being the largest grain market in the British Empire.

On running out of Winnipeg you enter immediately into the presence of the real and boundless prairie for the first time. Far away to the north and south stretches the illimitable plain. The productive character of the country is astounding, for a quarter of a century's cropping has not impaired to any appreciable degree its deep black soil. The operations of ploughing, reaping and threshing on a gigantic scale were described, views of grain elevators, prairie villages, and settlers' homes were shown, illustrations given of the towns of Qu' Appelle, Moose Jaw, Maple Creek, Medicine Hat and Calgary. Medicine Hat is a rising town of 6,000 inhabitants. On account of the immense flow of natural gas taken from natural underground reservoirs, and other advantages, Rudyard

Kipling christened it "the town that was born lucky," all lighting, heating and mechanical power being obtained from this natural gas. Here at mid-day the town gas lamps were still burning in the streets, because it is cheaper to let them burn night and day than to pay men to light them and turn them out. Two hours after leaving Calgary the train enters the Rockies by "The Gap," and we are at once in the midst of the most lovely mountain scenery. Descriptions and views were given of Banff Springs, with Lake Minnewanka and the Buffalo Park; Laggan, with Lake Louise in the clouds, being 5,670 feet above sea level, and the Valley of the Ten Peaks, with the remarkable Moraine Lake at the end. The journey taken through the Rocky Mountains was by the famous Kicking Horse Pass, passing the Syndicate Range, Field with Mount Stephen behind it, so called in honour of the first president of the C.P.R. (Canadian Pacific Railway), and then to the Selkirks, culminating in the exceedingly lofty pinnacle, named Sir Donald, 10,808 feet high, after Sir Donald Smith, now Lord Strathcona. After passing the Selkirks, the remarkable canyon of the Frazer River is traversed, and about one hundred miles further west the town of Vancouver is reached. Vancouver, like Vancouver Island, is named after the British seaman George Vancouver, who explored Puget Sound in 1793. Though there were a few settlers here at an earlier period, Vancouver practically dates from 1885, when it was chosen as the terminus of the C.P.R. In 1886, when it contained 600 inhabitants, the whole town was destroyed by fire, and now a quarter of a century later it is a town of 115,000 inhabitants. The business blocks are mainly of grey stone, and the business streets stretch along the gentle slope above the harbour, or run at right angles to them. The banks are a great institution in Vancouver, and most of them have palatial buildings, as are the post office, railway station, and some of the stores. Visits were paid to Chinatown and the beautiful Stanley Park, with its enormous cedar and other trees. One of them known as "The Big Tree" is 44 feet in circumference. Magnificent steamers are on the station for the run of eighty miles to Victoria, on Vancouver Island, and the capital of the province of British Columbia. The passage amongst the islands of the archipelago is exceedingly varied and pleasant, and splendid views are obtained of the Olympic Mountains in American territory. Vancouver Island is the largest of the numerous islands included in British

Columbia, being 290 miles long and from 50 to 80 wide. The greater part of the surface is covered with mountains, reaching a height of six to seven thousand feet, and only part of it has been explored or reclaimed. The island was discovered by Juan de Fuca in 1592, whose name has been given to the Strait leading to the open waters of the Pacific. Victoria is said to be the most English-like town on the American Continent, alike in climate and customs. The new Parliament buildings, with the Provincial museum and library to the left, and Government offices to the right, are amongst the finest specimens of such buildings in the world. A few miles to the west of Victoria lies Esquimault, an attractive English-looking town, with a dry dock, naval arsenal and barracks. This was the most western point reached by the lecturer, who then described his return journey by the Arrow Lakes and Crowsnest Pass through the Rockies, considerably south of the Kicking Horse Pass crossed on the outward journey, and at times within a few miles of the American frontier, a route which vies in interest with the northerly one, being broken up by entrancing sails on splendid steamers on the Arrow and Kootenay Lakes. It is in the neighbourhood of this latter lake that fruit growing has made such rapid progress in recent years, and the mining districts of Slocan, Roseberry and Sandon on the Arrow Lakes are amongst the richest in silver-lead ore on the Continent.

Returned to Port Arthur, steamer was taken here for a two days' sail down Lake Superior, through the famous Sault Ste. Marie Canal and Lock into Lake Huron, a two days' sail, a large portion of which was passed out of sight of land. At Sarnia, at the southern end of Lake Huron, train was taken to Niagara, then to New York and home.

The lecturer noted that Canada is a big country, thirty times as large as the United Kingdom. Last year 358,072 immigrants entered the Dominion, and they had been absorbed without causing any inconvenience, for he pointed out that practically six and a half out of the seven millions of the population live within 150 miles of the 3,000 miles long boundary line with the United States. There is room for all the unemployed of the old world, and if they are of the right sort occupation will be found for them. He alluded to the wonderful stories he had heard of the rapid fortunes made by lucky ones, but yet he had heard, and heard from their own lips, of the privations and troubles that others had undergone—

of women who lose their reason on the praries on account of the isolation, solitude, and flatness of their and its environment; of others who are saving their coppers in order to buy a ticket for England, only to find it costs more than did the outward ticket, the railway steamer companies having astutely made it easier to get into Canada than to get out; of the severity of the winters, which weed out the weak and unfit; of the dearness of living, a dollar (4s. 2d.) in Winnipeg only being equal to two shillings in Manchester. All intending settlers should weigh well the pros and cons of their undertaking.

However, Canada's future is assured. Her population is growing fast. Her railways are moving out westwards with lightning speed. Great cities are arising on her soil as if by magic. Millions of acres are being brought under the plough. Industries are springing up on every hand. And it is well that in this age of her progress and immense material growth and expansion English people should take an intelligent and sympathetic interest in this bright gem of the British Crown.

Proceedings of the Society.*

July 1st to December 31st, 1911.

The 884th Meeting of the Society was held in the Association Hall, on Tuesday, October 3rd, 1911, at 8 p.m.

The President of the Society, Mr. Harry Nuttall, M.P., F.R.G.S., presided.

Dr. J. B. Charcot, Officier de la Legion d'Honneur and Gold Medallist of the Royal Geographical Society, gave a lecture on " The Voyage of the ' Pourquoi Pas ?'," being an account of the Second French Antarctic Expedition.

The lecture was well illustrated with a very large number of fine slides and with cinematograph films, both being kindly shown by Mr. E. W. Mellor, J.P., F.R.G.S., with his powerful lantern.

The Chairman of the Council, Mr. F. Zimmern, F.R.G.S., moved a hearty vote of thanks to Dr. Charcot for his very interesting address, congratulations on his success and best wishes for the future; the Rt. Rev. Bishop Welldon, in seconding the resolution, mentioned the valuable services of Mr. Mellor in showing the slides and films with his own powerful electric lantern; the resolution was carried unanimously with acclamation.

A full Report of the Lecture is here given :—

Dr. Charcot in Manchester.

Dr. Charcot's lecture was an outline of the scheme and a description of many of the incidents of the Antarctic work which he did during the expedition that he took out from France in August, 1908, when he sailed in the " Pourquoi Pas." He explained to the audience very takingly the process by which he made up his mind to organise the " Pourquoi Pas " expedition. He had not long been back in France from his voyage with the " Français " to the same region; but the Academy of Science was of the opinion that the results of that voyage justified a new expedition, and he was asked to go. " Although when I had been in the Antarctic before," he said, " I had vowed that I would never go there again, I had hardly been a week in France when my greatest desire was to go back once more, so that I was not too sorry when I was asked to go back in the ' Pourquoi Pas ?' The hardest part of the work in Polar exploration is not to be there, but to get there, and to get the money to get there." The " Pourquoi Pas ?" went out to do a great deal of scientific work, in meteorology, chemistry, oceanography, terrestrial physics, geology and so on; but Dr. Charcot made almost no reference to the results. His lecture was a very lively, running commentary, strung together on a series of wonderful photographs and cinematograph pictures.

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* The Meetings are held in the Geographical Hall, unless otherwise stated.

In describing the start of the expedition, Dr. Charcot said that it was determined at the beginning that its work was not to be imperilled by any racing for the South Pole between himself and Captain Scott, who was starting at the same time; and he paid to Captain Scott a pleasant compliment on his present effort. "I hope," he said, "that Captain Scott will be successful. It is his right and due. He has been at work at the Antarctic for years and years. It was he who found the way there, and I hope that in a few months you will hear that the British flag has been raised at the South Pole." The "Pourquoi Pas?" called at various ports in South America on its southward way and found itself on the ground of its work when it reached Deception Island. When the earlier Charcot expedition was there, the lecturer said, they were quite alone; but they found on returning lots of little ships there, whaling. On the way to Peter I. Island, where the winter of 1908–9 was spent, the "Pourquoi Pas?" looked up the scenes of the work of the previous expedition, and at one place found a winter house, where many of the things that had been left behind were found in very good condition. "We found a box of matches," Dr. Charcot said. "They were in such good condition that certainly they could have been fired if they had not been made by the French Government." In the sea off the coast they found sulphur baths at one spot. "When Aix-les-Bains runs out," said Dr. Charcot, "all the people no doubt will go to Deception Island, and baccarat and other such games will make their appearance there, to the astonishment of the penguins." It was thereabouts, however, that the first and perhaps the greatest misfortune of all befell them. The "Pourquoi Pas?" ran aground and ripped off 13 metres of its keel, leaving a leak that took in two tons of water every hour for the rest of the voyage.

At Peter I. Island the "Pourquoi Pas?" lay up for the winter, while the expedition did nine months' work, of which Dr. Charcot said very little. There were some astonishing photographs of the last stages of the journey to the island, when the "Pourquoi Pas?" had to break its way through mile after mile of ice. The lecturer described it as very slow travelling. "It was," he said, "like travelling in a train belonging to the French Government; but there was a little difference, for on our journey you were sure of getting somewhere." To the difficulties and the discomforts of the winter he alluded only in a sentence. "It is impossible to think of anything more melancholy than the winter of 1908–9;" but he retailed very cheerfully the amusements and little adventures of the period, such as the Shrove Tuesday and July 14 celebrations. On Shrove Tuesday there was a fancy dress fête, to which every member of the staff turned up, without prearrangement, dressed as a tropics explorer. On the 14th of July they had a great feast, drank a good deal of champagne and French wine, and had bad headaches next morning. There was much that was amusing about the penguins, and many interesting photographs, but Dr. Charcot only mentioned casually the dangers of the outbreak of scurvy which disabled a part of the crew. In spring the expedition returned to Deception Island for coal; and a further great amount of geographical and general scientific work was done before the expedition, short of coal and attacked a second time by scurvy, was forced to return.

Dr. Charcot made one reference only to the geographical discoveries with which his name are associated. In the last voyage he has ascertained by the discovery of new land the continuity of the land between Loubet Land, in W. long. 70deg., and King Edward VII. Land, in W. long. 150deg.; a fact which he mentioned pleasantly as an "entente cordiale." He was within a few miles of Captain Cook's Farthest South in long. 110deg., but chose to leave the honour with Cook's steamless vessel. Finally, within a minute, there were thrown on the screen two photographs contrasting the map of the Antarctic in 1898, after the voyage of the "Belgica" and before the first voyage of the "Français," with the map of this present day, including Dr. Charcot's last results. The audience had only a very brief opportunity of realising the vast quantity of discovery for which Dr. Charcot is responsible.—(*Manchester Guardian.*)

The 885th Meeting of the Society was held on Tuesday, October 10th, 1911, at 7.30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S., Chairman of the Council.

The minutes of the Meetings held on April 10th and on October 3rd were taken as read.

The Chairman announced that the Council had presented a loyal address to His Majesty the King, Patron of the Society, and a gracious acknowledgment had been received, copies of which are here given:—

Manchester Geographical Society.
Patron: His Majesty King George V.

To the

King's Most Excellent Majesty.

The members of the Manchester Geographical Society, of which Your Majesty has been graciously pleased to become Patron after close association with its work for nineteen years, most humbly beg to present their loyal and hearty congratulations on the auspicious event of Your Majesty's Coronation.

With all Your Majesty's loyal and faithful subjects they pray that your rule over your vast Empire, of which your Majesty has unequalled personal knowledge, may be blessed by Almighty God with peace and increasing prosperity.

They rejoice that, on the occasion of Your Majesty's Coronation, peace prevails throughout an Empire greater and more extended than has ever previously existed, and they trust that amicable relations with other countries will be a marked feature of Your Majesty's reign.

They pray that our Heavenly Father's blessing may rest over you and that in the hearts of your many subjects, varied as they are in race, in tradition, and in creed, Your Majesty may through long, happy and prosperous years continue to reign, honoured, revered and loyally beloved.

Signed on behalf of the Manchester Geographical Society :

HARRY NUTTALL, *President.*
F. ZIMMERN, *Chairman of the Council.*
EDWD. W. MELLOR, *Vice-Chairman of the Council.*
DAVID A. LITTLE, *Honorary Treasurer.*
EGBERT STEINTHAL, } *Honorary Secretaries.*
J. HOWARD REED, }
HARRY SOWERBUTTS, *Secretary.*

16, St. Mary's Parsonage,
Manchester,
June, 1911.

Home Office,
Whitehall,
11th July, 1911.

SIR,

I am commanded by the King to convey to you hereby His Majesty's thanks for the Loyal and Dutiful Address of the members of the Manchester Geographical Society on the occasion of Their Majesties' Coronation.

I am,
Sir,
Your obedient servant,
WINSTON S. CHURCHILL.

The Chairman also announced that the Society had lost by death the following members :—Mrs. Bowes, Messrs. W. H. Buckley, J.P., W. Young Martin, M.D., C. Roeder, F. Smallman, F.R.G.S., and A. C. C. Somers, LL.B.

And that the following members had been elected :—The Rt. Hon. Lord Egerton of Tatton, Mrs. Crompton, Mrs. Smith, Miss E. Boyland, Miss S. Lambert and Mr. Arnold Dawson.

Miss M. Constance Geldart gave an account of her visit to "The Dolomites."

The address was illustrated with lantern views. The Chairman, on behalf of those present, tendered hearty thanks to Miss Geldart for the interesting account which she had given of her visit to that portion of the Alps.

The 886th Meeting of the Society was held in the Association Hall, Mount Street, on Tuesday, October 17th, 1911, at 7.30 p.m. Mr. F. Zimmern, F.R.G.S., Chairman of the Council, presided.

The death of Sir W. J. Crossley, Bart., Vice-President, was mentioned by the Chairman and a resolution expressing sincere sympathy with Lady Crossley and family was passed.

Mr. E. W. Mellor, J.P., F.R.G.S., gave a lecture entitled "A Chronological Survey of the Landmarks of Ancient Egypt as revealed in her 'Temples and Piles Stupendous.'" The Address was illustrated with colour-photography and other lantern slides taken by the Lecturer, and shown by means of his own powerful lantern.

Mr. J. Stephenson Reid moved that the hearty thanks of those present be given to Mr. Mellor for his very interesting address and for the splendid slides with which it had been illustrated, and to his helpers at the lantern who had in such an efficient manner shown the slides. The Chairman seconded the resolution, and it was passed unanimously with applause.

The 887th Meeting of the Society was held in the Association Hall on Tuesday, October 24th, 1911, at 7.30 p.m.

Mr. F. Zimmern, F.R.G.S., Chairman of the Council, presided.

Mr. F. F. Ogilvie, Hon. Secretary of the United States Egypt Exploration Fund, gave a Lecture entitled: "The Probable Solution to the Riddle of the Sphinx."

The lecture was illustrated with colour-photography and other lantern slides kindly shown by Mr. E. W. Mellor, J.P., with his powerful lantern.

The Rt. Rev. the Bishop of Salford moved a resolution thanking Mr. Ogilvie for his very interesting and instructive address. Mr. Zimmern, in seconding the resolution, made special reference to the valuable services of Mr. Mellor, first, in inducing Mr. Ogilvie to give the lecture, and further in so efficiently and successfully exhibiting the slides, especially the coloured slides taken directly by photography. The resolution was passed unanimously with acclamation.

The 888th Meeting of the Society was held on Tuesday, October 31st, 1911, at 7.30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S., Chairman of the Council.

The Minutes of the Meetings held on October 3rd, 17th and 24th were taken as read.

The Chairman mentioned the death of Alderman R. Gibson, J.P., who had been a member of the Society for many years, and reported that the Society was represented at his funeral by the Secretary, and that a letter of sympathy to the relatives had already been sent by the direction of the Executive Committee.

Mr. Charles F. Pughe, M.A., gave a Lecture on 'Captain James Cook, R.N., F.R.S." The address was well illustrated with lantern views of maps (some of Captain Cook's original maps being reproduced), of copies of old engravings illustrating his voyages, and of recent photographs of some of the places to which reference was made.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer for his very interesting address.

The 889th Meeting of the Society was held on Tuesday, November 7th, 1911, at 7.30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S., Chairman of the Council.

The Minutes of the Meeting held on October 31st were taken as read.

The Chairman announced the election of the following members: Ordinary: Mrs. James Barningham, Mrs. Turner, Messrs. G. F. Armitage, J.P., L. C. Evans, P. J. Liddell, W. Lowe, Edgar Moreland, W. J. P. Orton, and W. J. Sprott, M.D. Associate: Miss Lowe, Mrs. Markham, Messrs. E. W. Jackson and C. H. Wrigley.

Mr. F. Lambert, F.R.G.S., described a visit to "The Yarrangobilly and Wombeyan Caves, New South Wales."

The lecturer first described the journey by the Great Southern Railway and Coach Routes, illustrating his remarks with very fine coloured slides of the scenery, and then dealt with the caves. The slides of the interiors of the caves were shown on the lecturer's own specially prepared screen and the resulting pictures were beautiful and realistic.

On the motion of the Chairman it was resolved that the thanks of the Meeting be given to Mr. Lambert for his interesting address, and especially for the beautiful slides with which it was illustrated.

The 890th Meeting of the Society was held in the Association Hall, Mount Street, on Tuesday, November 14th, 1911, at 7.30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S., Chairman of the Council.

Mr. W. Hennessey Cook, F.R.G.S., gave a Lecture entitled: "Canada and its Wonderful Resources." The address was illustrated with a large number of lantern views.

The Chairman, on behalf of the Meeting, tendered the hearty thanks of all present to the lecturer for the very interesting account which he had given of his journey in Canada and of the progress made by the Great Dominion and also to the Canadian Pacific Railway Company for their kindness in arranging the lecture.

The 891st Meeting of the Society was held on Tuesday, November 21st, 1911, at 1.30 p.m. In the Chair, Mr. Charles A. Clarke

The Minutes of the Meetings held on November 7th and 14th were taken as read.

The election of Miss Guerin as an Ordinary Member was announced.

Mr. G. F. Armitage, J.P., described a "Visit to Tangiers and Spain," giving a very clear and interesting account of life and travel in Southern Europe, concluding with a description of his experiences in Tangiers The address was illustrated with some very good lantern views prepared by him from photographs taken during the journey.

On the motion of the Chairman, it was unanimously resolved that the thanks of the Meeting be given to Mr. Armitage for his very interesting and instructive address and for the illustrations shown.

The 892nd Meeting of the Society was held on Tuesday, November 28th, 1911, at 7.30 p.m. In the Chair, Mr. George Ginger.

The Minutes of the Meeting held on November 21st were taken as read.

The election of Mr. J. Gamble as an Ordinary Member was announced.

Mr. S. Ashworth described "A Tour through the Tyrol, Salzburg and Salzkammergut." The address was illustrated with a large number of lantern slides prepared by the lecturer from photographs taken on the journey.

The Chairman proposed, and it was unanimously resolved, that the thanks of those present be given to Mr. Ashworth for the very interesting account which he had given of his journey and for the fine views with which it was illustrated.

The 893rd Meeting of the Society was held on Tuesday, December 5th, 1911, at 7.30 p.m. In the Chair, Mr. J. Howard Reed, F.R.G.S.

The Minutes of the Meeting held on November 28th were taken as read.

Professor R. M. Burrows, D.Litt., gave a lecture on "His Recent Excavations in Greece." The lecture was illustrated with lantern views prepared from the lecturer's own photographs.

It was unanimously resolved, on the motion of the Chairman, that the sincere thanks of those present be tendered to Professor Burrows for his interesting and instructive lecture and for the fine illustrations shown.

The 894th Meeting of the Society was held on Tuesday, December 12th, 1911, at 7.30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S., Chairman of the Council.

The Minutes of the Meeting held on December 5th were taken as read.

The Chairman announced the election of Mr. James Smith as an Ordinary Member and Mr. B. R. Tydeman as an Associate Member.

Dr. C. E. Moss, B.A., F.R.G.S., described a "Botanical Visit to Algeria and the Algerian Sahara." The address was illustrated with lantern views prepared from photographs taken on the journey.

Mr. J. Howard Reed, F.R.G.S., moved, and the Chairman seconded, a hearty vote of thanks to Dr. Moss for his very interesting lecture and for the fine slides with which it was illustrated. The resolution was passed unanimously.

The 895th Meeting of the Society was held on Tuesday, December 19th, 1911, at 7.30 p.m., and took the form of a lecture to the children of the members. Mr. Walter Taylor presided.

Mr. Wm. H. Ward gave a lecture on his journey "Through Switzerland to the Italian Lakes, Milan and Genoa, returning along the Rivieras." The lecturer freely illustrated his remarks with lantern slides, about 200 in number, and gave an interesting and instructive account of his journey. The route was by way of Lausanne and Montreux (and the Castle of Chillon) on beautiful Lake Leman, up the Rhone Valley to Brieg, walking thence over the Alps through the Simplon Pass into Italy (Isella); on to Domo d'Ossola and Stresa on Lake Maggiore; sailing round the Italian Lakes (Maggiore Lugano and Como) to Como; train to Milan and Genoa; returning from Genoa along the Italian and French Rivieras, stopping at all the principal resorts (San Remo, Ventimiglia, Mentone, Monte Carlo, Nice and Cannes), and at Toulon and Marseilles.

The children showed their appreciation of the large number of beautiful slides and of the lecturer's interesting remarks by several rounds of hearty applause.

List of Maps, Books, Journals, etc.,

ACQUIRED BY THE SOCIETY FROM JANUARY 1st TO DECEMBER 31st, 1911.

MAPS.

GENERAL.

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Washington. D.C. Carnegie Institution. Report of Celebration of Tenth Anniversary. Department of Terrestrial Magnetism. Annual Report of the Director, 1911. Nine Reprints from Terrestrial Magnetism and Atmospheric Electricity, 1911.

Washington, Conn. Association of American Geographers. Annales. 1911, Vol. I.

Zurich. Geographisch-Ethnographischen Gesellschaft in Zurich. Jahresbericht. 1910–1911.

List of Members,

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Note.—H signifies Honorary, C—Corresponding, L—Life, A—Associate,
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ARobinson, A. S.
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HWillcocks, Major-General Sir James, K.C.M.G., D.S.O.
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Woolfenden, R. S. H.
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AWoolston, Miss M.
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LWrathmell, T.
Wright, Reginald.
AWrigley, Chas. H.

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Rules.

I. OBJECT AND WORK.

The object of the Manchester Geographical Society is to promote the study of all branches of Geographical Science, especially in its relations to commerce and civilisation.

The work of the Society shall be :—

1. To further in every way the pursuit of the science; as, by the study of official and scientific documents, by communications with learned, industrial and commercial societies, by correspondence with consuls, men of science, explorers, missionaries, and travellers, and by the encouragement of the teaching of geography in schools and colleges.

2. To hold meetings at which papers shall be read, or lectures delivered by members or others.

3. To examine the possibility of opening new markets to commerce and to collect information as to the number, character, needs, natural products and resources of such populations as have not yet been brought into relation with British commerce and industry.

4. To promote and encourage, in such way as may be found expedient, either alone or in conjunction with other Societies, the exploration of the less known regions of the earth.

5. To inquire into all questions relating to British and Foreign colonisation and emigration.

6. To publish a Journal of the proceedings of the Society, with a summary of geographical information.

7. To form a collection of maps, charts, geographical works of reference, and specimens of raw materials and commercial products.

8. The Society shall not enter into any financial transactions beyond those necessarily attached to its declared object, and shall not make any dividend, gift, division, or bonus in money unto or between any of its members.

II. ORGANISATION.

9. The Society shall consist of ordinary, associate, corresponding, and honorary members.

10. A Council shall be chosen annually from the ordinary members to conduct the affairs of the Society. It shall consist of a President, four or more Vice-Presidents, a Treasurer, two or more Honorary Secretaries (including a Secretary for Foreign Correspondence), and twenty-one Councillors.

11. There shall be three Trustees elected by the Society, who shall hold office until death, disability, insolvency, or resignation. They shall be members of the Council by virtue of their office.

12. Any vacancy occurring in the Council during the current year may be filled up by the Council.

III. ELECTION OF MEMBERS.

13. Every candidate for admission into the Society as an ordinary or an associate member must be proposed by a member. The proposal shall be read out at the next Ordinary Meeting of the members, and any objection shall be forwarded in writing to the Secretary within seven days.

14. The election of members is entrusted to the Council. The names of those elected shall be announced from the chair at the next Ordinary Meeting after the election.

15. The Secretary shall within three days forward to every newly-elected

member notice of his election, a copy of the Rules of the Society, and a card announcing the days on which the Ordinary Meetings will be held during the session. But the election of an ordinary or associate member shall not be complete, nor shall he be permitted to enjoy the privileges of a member, until he shall have paid his first year's subscription. Unless such payment be made within three calendar months from the date of election the election shall be void.

16. The Council shall have power to elect honorary and corresponding members.

17. Women shall be eligible as members and officers of the Society.

IV. PAYMENTS.

18. An ordinary member shall pay an annual subscription of £1. 1s., or he may compound by one payment of £10. 10s. An associate member shall pay an annual subscription of 10s. 6d. The Society's year shall begin on the first day of January.

19. Members shall not be entitled to vote or to enjoy any other privilege of the Society so long as their payment shall continue in arrear, but associate members shall not vote nor shall they take any part in the government of the Society.

20. The first annual payment of a member elected in November or December shall cover his subscription to the 31st December in the year following.

21. On the first day of January in each year there shall be put up in the rooms of the Society a complete list of the members with the amount of their subscription due, and as the amounts are paid the fact shall be marked on the list.

22. Notice shall be sent to every member whose subscription shall not have been paid by the first of February, and if the arrears are not discharged by the first of July the Council may remove the member from the list of members. Any member, whose subscription is in arrear for two years shall not be entitled to receive the Journal of the Society.

V. MEETINGS.

23. The meetings of the Society shall be of three kinds—Ordinary, Annual, and Special.

24. In all meetings a majority of those present shall decide all questions, the President or Chairman having a casting vote in addition to his own.

Ordinary Meetings.

25. The Ordinary Meetings of the Society shall be held once a month, from the month of October to the month of May, or oftener, if judged expedient by the Council.

26. All members whose subscriptions are not in arrear shall have a right to be present. All ordinary members shall have the privilege of introducing one visitor.

27. The order of the proceedings shall be as follows:—

- (a) The minutes of the last meeting to be read and if correctly recorded they shall be signed by the Chairman.
- (b) Presents, whether of money, books, maps, charts, instruments specimens made to the Society to be announced.
- (c) The election of new members to be declared and the names candidates to be read.
- (d) Papers and communications to be read and discussed.

28. At these meetings nothing relating to the rules or management shall be

brought forward, but the minute book of the Council shall be on the table at each meeting for the inspection of any member, and extracts therefrom may, with the consent of the chairman, be read to the meeting on the requisition of any member.

29. On occasions of exceptional interest the Council may make provision for a larger admission of visitors.

Annual Meetings.

30. The Annual Meeting of the members shall be held at such time and place as the Council may determine.

31. Fourteen days' notice of such meeting shall be sent to every member within the United Kingdom who has given his address to the Secretary, and notice of the meeting shall be advertised in such newspapers as the Council may direct.

32. The object of this meeting shall be to receive the Annual Report of the Council and the Treasurer's Balance Sheet, to hear the President's address, to elect the Council and officers for the ensuing year, and to transact any other business.

33. Any two ordinary members may nominate candidates for the Council or for office not later than one week prior to the day of election, and the names of candidates so nominated shall be at once put up in the rooms of the Society. The election of the Council and officers shall be by ballot.

Special General Meetings.

34. The Council may call a Special General Meeting of the Society whenever they shall consider it necessary, and they shall do so if required by 20 ordinary members.

35. A week's notice of the time and object of every Special Meeting shall be sent to all members. No other business shall be entertained than that of which notice has been thus given.

36. Twenty ordinary members shall form a quorum.

VI. COUNCIL AND OFFICERS.

The Council.

37. The government of the Society shall be entrusted to the Council, subject to the rules of the Society.

38. The Council shall annually elect a Chairman and Vice-Chairman.

39. The President or the Chairman, or any three members of the Council, may at any time call a meeting thereof, to which every member of the Council shall be summoned.

40. Seven shall form a quorum.

41. In order to secure the most efficient study and treatment of the various subjects which constitute the chief work of the Society, the Council may appoint Committees for special purposes. These Committees, with the approbation of the Council, may associate with themselves any persons—whether members of the Society or not—from whom they may desire to obtain special assistance or information. The Committees shall report to the Council the results of their proceedings.

42. The President, Chairman, Vice-Chairman of the Council, and the Honorary Secretaries, shall, by virtue of their offices, be members of all Committees appointed by the Council.

President and Vice-Presidents.

43. The President is, by virtue of his office, the chairman of all the meetings of the Society. In the absence of the President, one of the Vice-Presidents may preside.

Chairman of the Council.

44. It is the duty of the Chairman of the Council to see that the rules are properly observed, to call for reports and accounts from Committees and Officers, and to summon, when necessary, special meetings of the Council and of Committees.

Treasurer.

45. The Treasurer has the charge of all accounts; he shall pay all accounts due by the Society after they have been examined and approved by the Council.

46. He shall see that all moneys due to the Society are collected, and shall have power, with the approval of the Council, to appoint a collector. All moneys received shall be immediately paid to the bankers of the Society.

47. The bank passbook and the book of accounts shall be laid upon the table at every ordinary meeting of the Council.

48. The accounts shall be audited annually by two members, who shall be elected at an ordinary meeting at least one month before the Annual Meeting.

Secretaries.

49. The duty of the Honorary Secretaries shall be :—

- (a) To conduct the correspondence of the Society and of the Council.
- (b) To attend the meetings of the members and of the Council, and minute their proceedings.
- (c) At the ordinary meetings, to announce gifts presented to the Society since their last meeting; to read the names of all new members and of candidates for admission, and the papers communicated to the Society, which have been directed by the Council to be read.
- (d) To have immediate superintendence of all persons employed, to make arrangements for the meetings of the Society, and to take charge of all maps, books, furniture and other effects.

50. It shall be the more especial duty of one of the Honorary Secretaries to conduct, as may be directed by the Council, correspondence with Foreign Societies, and with persons resident abroad.

51. In addition to the Honorary Secretaries, there shall be a paid Secretary appointed by the Council, whose duties shall be to assist the Honorary Secretaries, to issue the notices of the Council and of the Society, and to act under the instructions of the Council.

The foregoing Rules, as now amended, were approved and adopted at a meeting of the members of the Society, of which due notice had been given to the members, held in the Town Hall, Manchester, Wednesday, October 3rd, 1894.

(Signed) GEORGE, President.
S. ALFRED STEINTHAL, Chairman.
F. ZIMMERN, Honorary Secretary.
JAS. D. WILDE, M.A., Honorary Secretary
ELI SOWERBUTTS, Secretary.

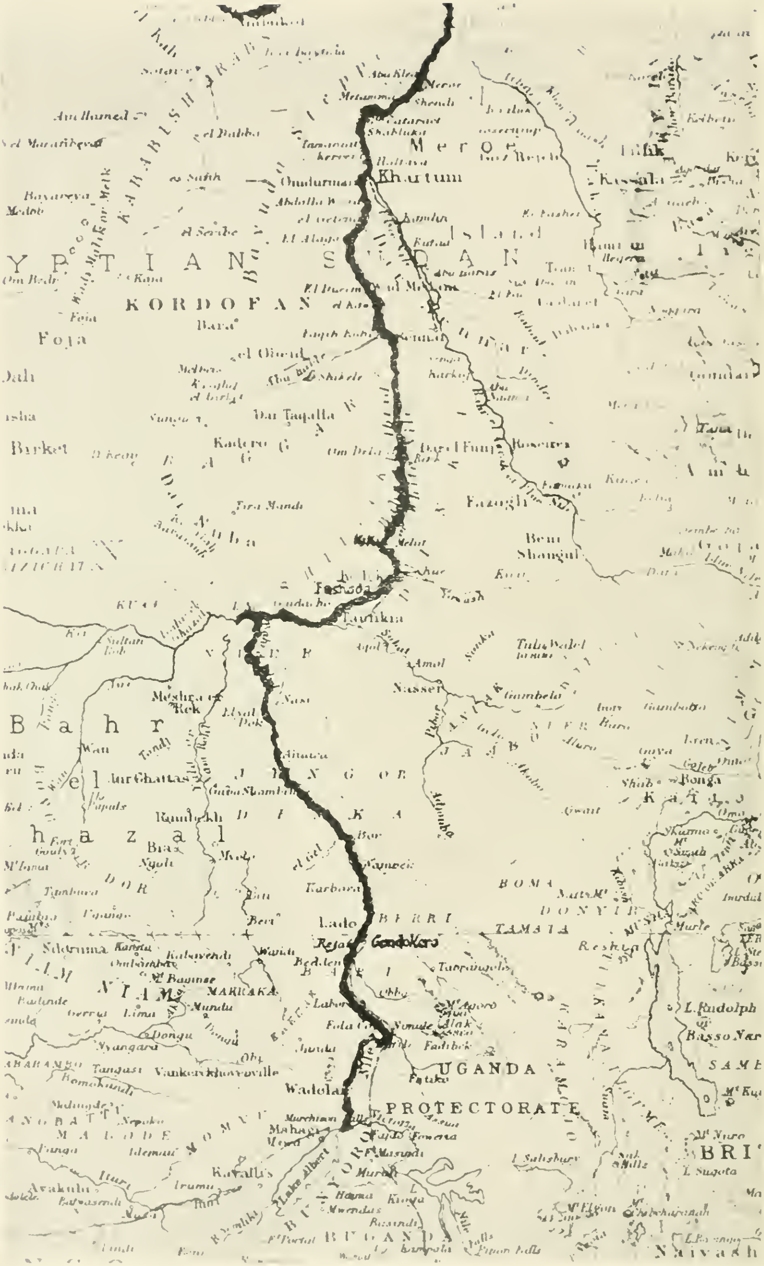
[Copy.]

It is hereby certified that this Society is entitled to the benefit of the Act 6 and 7 Vict., Cap. 36, intituled "An Act to exempt from County, Borough, Parochial, and other Local Rates, Lands and Buildings occupied by Scientific or Literary Societies."

Seal of Registry of
Friendly Societies.

This 15th day of January, 1895

E. W. B.



Map of the White Nile, from Uganda to Khartoum.

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1912

The
COUNCIL AND OFFICERS
# of the
MANCHESTER GEOGRAPHICAL SOCIETY
for 1912.

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The Journal

OF THE

Manchester Geographical Society.

* * *

THE MAFULU MOUNTAIN PEOPLE OF BRITISH NEW GUINEA.

By Robert W. Williamson.

(A Short Summary of the Address delivered to the Society in the Geographical Hall on Tuesday, January 9th, 1912.)

Mr. Williamson returned last year from an expedition to the interior of New Guinea, during which he spent a considerable time among those people, whose villages are 4,000 and 5,000 feet up in the mountains, and of whom hardly anything was known. He succeeded in collecting a large amount of information with reference to them and their arts, crafts, customs, ceremonials and superstitions.

The Mafulu are a short people, averaging 5ft. 1in. in stature, slightly built but fairly strong, somewhat round-headed, of sooty-brown skin colour, and with frizzly hair, predominantly brown in colour. The dress of both men and women consists merely of a narrow perineal band passed between the legs and tied round the waist, the women in this respect differing from those of the adjoining plains and coast-lines, all of whom wear short grass petticoats. They do not tattoo or scarify the flesh, but they decorate themselves with plaited belts, armlets, and leg bands and with various head ornaments and necklaces, made chiefly of shells, beads, dogs' teeth, areca nut fruit and pieces of cane, and on the occasions of ceremonial dances they are most elaborately ornamented with feathers upon their heads and backs, including huge frame erections of feathers towering 6 or 12 feet above their heads.

They live in scattered clusters or communities of villages, but there are usually in each of these communities two or more clans, each clan, however, having its own villages or village within the community group, its own chief and its own club house, the latter being here, as elsewhere in New Guinea, the public building of the clan, used as the living house for the unmarried men and for visitors, and in connection with ceremonial performances. Mr. Williamson could, however, find no trace of clan badges or of totemism in connection with these clans. The ceremonials of these people are very interesting. There is no ceremony on the birth of a child, except in case of that of the first-born of a chief, which event is signalised by a visit of women from another community, who attack the chief's house with spears. Nose boring is the subject of a prior incantation, and after the operation the patients are confined in specially built houses and are under special taboo restrictions as to diet, and, finally, each of them has to draw the living body of a small snake through the hole in his nose. Their marriage ceremony shows no trace of marriage by capture, and, indeed, consists merely of a visit by the boy to the house of the girl's parents and a return visit by the boy and the girl and her father to the house of the boy's parents, and payment of the price for the girl. Funeral ceremonials are attended by visitors from other villages; there is much smearing of the people's bodies with mud and wailing of the funeral song and much shouting by the men, the intention of the latter being to scare away the ghost of the deceased. A few days after the funeral there is a feast with dancing and pig killing, and after an interval there is another feast, with its accompanying dancing, at which a special string mourning necklace worn by the nearest relative is cut off, dipped in pig's blood and thrown away, and he is painted with bands of colour on both his cheeks, whereupon the period of mourning of himself and all the other relatives comes to an end. Ordinary persons are buried underground; but the bodies of chiefs and their families and important people are placed in shallow open wooden boxes, which are fixed either on a scaffold of poles in the village enclosure or in a spirit-haunted species of fig tree, and are there left to decay. For a few weeks after this platform or tree burial the village is deserted by the people, who go off into the bush; but two men have to remain in the village, and endure the awful smells emanating from the decomposing body. The most important ceremonial, however, is the "Big Feast," which only occurs at long intervals, and at which the scaffolding of one of these chief's platform graves is cut away, and the skull and bones of the chief, which fall to the ground, and those of other prominent people are worn by the dancers on their arms, and are afterwards the subject of an important ceremonial, some being dipped in the blood of the slain pigs, and all others being touched with the bones so dipped, after which all the skulls and bones may be thrown away. The origin and purpose of this feast is not known by the Mafulu people; but Mr. Williamson has little doubt that it must be sought for in a desire to finally "lay" the ghosts of the departed great ones. The Mafulu are cannibals, but not head hunters, the victims always being persons of another community killed in individual fight or in battle; and killing for the sake of eating never being resorted to. Infanticide is very common, and some extraordinary recognised reasons for it were stated by the lecturer. The art of these people is very primitive, their designs being confined to straight lines, zig-zags and spots. Mr. Williamson concluded his lecture with observations on the probable ancestry of the Mafulu. It had been supposed that they were a mixture of the Papuan and Melanesian type found on the coast and plains. His stay among them, however, convinced him that there was some other blood also in their veins, and in view of their short stature, their slight but strong physique, their comparatively rounded heads, the dark colour of their skin and the predominating brown colour of their hair, he is of opinion that this third blood is Negrito (Pigmy), and suggests that they are in part descended from an original Negrito people, who were probably the original inhabitants of the whole island of New Guinea, before the present Papuan and Melanesian races established themselves there.

* * *

THE PATHWAYS OF THE PAST.

Being some impressions of the chief places of interest, historically and commercially, on the shores of the Mediterranean Sea.

By Miss Kate Qualtrough.

(Addressed to the Society in the Geographical Hall, on Tuesday, January 16th, 1912.)

History is silent, regarding the name of that primitive man who, in the dim dawn of the world's history, first trusted himself upon the treacherous and unstable waves.

But though, like many others of the world's great benefactors, he has come and gone, leaving only as a memorial the good that he accomplished, a place of honour is reserved for him at the head of that long line of great seamen including, through the flight of time, men of such varying personalities, voyaging in such different ships as Pytheas and Columbus, Drake and Raleigh, Captain Cook and Nelson, Franklin and a myriad others, who obeyed that instinct of the sea, which, even in the present age, is happily handed down from generation to generation.

Little is it realised that the evolution of the ship meant the promotion of civilisation and commerce, and the general prosperity of nations. Without it, continents would have remained undiscovered, countries been kept apart by intervening seas: islands would have remained isolated and all interchange of wealth, thought and development must necessarily have been restricted to land-girt territories. Civilisation and Christianity would never have reached our own isles and America would have remained unknown. For the ship is just a floating bridge connecting land and sea, the most human of all inanimate things and honoured because of (1) its early growth, (2) nobility of birth, (3) length of pedigree, and (4) especially heroic behaviour, when called upon to carry valuable lives and freight across the ocean, for do not the grandest examples of courageous enterprise belong as much to the sea and ships as to the battle field? Between man and water there has always existed a feud—the one ever trying to overcome the other, the river and the tidal estuary being his acknowledged enemies, serving to excite his fighting instinct.

Civilisation having spread from the East, it is certain that the dwellers on the banks of the Euphrates and Tigris must have been the witnesses of the novel sight of man sailing on either skins, rafts or dug-outs, to reach the sea coast, and from the observation of that curious shaped-fish the Nautilus they evolved the idea of ships.

The Sons of Noah, it is said, peopled the earth: Shem migrating eastward to Asia, Japheth to the Mediterranean coast, and Ham to Egypt, the land with which the Hebrews were best acquainted, and at the earliest part of Bible history the seat of a powerful Empire of high civilisation and extensive commerce; ships being in existence 6,000 B.C. from the evidence of amphora or vases bearing crudely drawn but unmistakable ships with mast and square sail set very far forward in the bows, a cabin in the stern for the commander and a platform on which a look-out man is depicted with a pole in his hand for water soundings.

Other evidence is found in the wall paintings in the Temple of Queen Hat-ship-itu, illustrating ships arriving and departing from the Land of Punt (supposed to be the modern Somaliland), loading and unloading incense, trees, monkeys, woods, ivory, gold, silver, and leopard skins. Models of ships have also been found in the tombs—the reason for this being the Egyptian belief that by using words of magical power they could be transformed into ghostly forms of their originals, which had existed on earth, and thus provide the dead with a means of sailing about in the waters of Hades.

The position and character of Egypt accounted to a great extent for its importance in the Ancient World; being situated midway between the two continents of Asia and Africa, it was the gate through which all intercourse between them was carried on, and also providing easy communication between the southern peninsulas of Europe and the coasts of India, it was the connecting link between East and West. Surrounded by deserts, the Valley of the Nile formed a large oasis, isolated from adjacent countries. This geographical position is the explanation of the durability and continuity of this ancient empire—it being unaffected by foreign invasion for a period exceeding 2,000 years. Although the navigation of the Egyptians was not restricted to the waters of the River Nile they were not a seafaring people and their trade was carried on by caravans; the Nubians acting as their carriers, being fitted by birth and habit to endure the privations and dangers incident to the long journeys across the desert. The oases were of great commercial importance, fully justifying the appellation of the Island of the Blessed which was applied to one of them. They served as stations to connect Egypt and Ethiopia and Carthage in one direction and with Central Africa in another, their full advantage was only realised when the camel was introduced from Asia by the Persians, afterwards they were occupied and garrisoned by the Greeks and Romans. Herodotus described a chain of them, which crossed Africa from East to West and they were reached at intervals of ten days' journey.

The position of Alexandria was due to the commercial genius of the Greeks. It stood on a tongue of land between L. Mareotis and the Mediterranean Sea, and was founded by Alexander the Great, whose military expeditions form so important an epoch in the history of geography, his conquests having a permanent influence on the future process of discovery, even physical science receiving a fresh impetus from the discovery of the rich and varied products of the Eastern world. The most interesting remains of the Old Town are Pompey's Pillar and Cleopatra's Needles.

The former is a large column of red granite, conveyed 600 miles from the quarry. It is believed to have belonged to a temple of Jupiter Serapis in former times and to have been subsequently re-erected as a monument by the Romans to Diocletian. The shaft is 67 feet 3 inches high and its weight 288 tons. Cleopatra's Needles bearing the distinctive sign of Thothmes III were brought from Heliopolis by one of the Caesars.

No nation in the world has taken such pains to transmit its memory to posterity as the Egyptians. In its marvellous and stupendous monuments, whether erected on the surface of the earth or excavated from its depths, it has left behind not merely proofs of its greatness, but has endeavoured by covering them with sculptural representations of its religion, its public affairs, and even of private life with its numerous occupations, to hand down the remembrance of them to our own generation. (It is quite certain that machines capable of effecting such great results could never have been invented without a knowledge of mining, purifying and tempering metals, which requires an intimate acquaintance with chemistry together with the most indefatigable researches and experiments carried on for ages. And without a knowledge of mathematical science—neither the power of the machines could have been computed, nor the machines themselves rightly adjusted.) Their monuments still stand to inform posterity that 3,000 B.C. the Egyptians had learned to transport the heaviest blocks of marble from Syene to the Delta, to cut and polish them with a precision not surpassed in modern times, besides using them constructively with a degree of science unequalled from that day to this.

Egypt was in truth the gift of the Nile, its commerce passing up and down the broad stream as on a high road, and for commercial purposes two canals connected its waters with the Red Sea, and were called at different periods Ptolemy's and Trajan's River. They were commenced by Pharaoh Necho 610 B.C. Thus something analogous to the Suez Canal which now connects the Mediterranean and the Red Seas has been in existence from the earliest times. The value of the Suez Canal is mainly felt in the routes to India, China and Australia. From Port Said to Suez it has a length of 87 miles.

After the decline of Egypt her place as the pioneer of commerce was taken by the Phœnicians who were a prosperous nation before the Israelites entered the Promised Land, and when King David was at the height of his power they were the chief commercial people in the world, as well as being famous for their artistic skill as workers in the precious metals. It will be remembered that Hiram of Tyre and other workmen were sent to Jerusalem; the plan and decorations of the Temple being purely Phœnician in character. They also excelled in manufacturing, dyeing and embroidering cloth for the Egyptians. Solomon was indebted to the Phœnician King for sailors to navigate his ships to Ophir and Tarshish, the united fleets sailing there every three years, the route being by Cyprus, Islands of the Aegean Sea, Sicily, Malta, North coast of Africa to the South of Spain.

We, who belong to a race of seamen, cannot but extend the greatest admiration to the great daring and enterprise of the world's first (great) sailors. The fullest extent of their voyages cannot be ascertained with any certainty, but there is every reason for believing that under Pharaoh Necho they sailed round Africa more than 2,000 years before Vasco di Gama's discovery. It is important to remember that they started from the Red Sea and returned through the Strait of Gibraltar, having the advantage of the Northern Monsoon to carry them southward to the tropics and the southern trade wind to bring them home after an absence of three years. They also crossed the Bay of Biscay to Britain.

Their coast was sufficiently broken to supply several harbours large enough for the requirements of Phœnician commerce prosecuted on a most extensive scale by the overland routes to Babylon, Persian Gulf, Arabian Sea, and with their colonies which lined the shores of the Mediterranean Sea to its western extremity, and not insignificant vestiges of their handicraft still exist in Sicily.

Being sea sailors they chose not so much the model of the Egyptian vessels as those which time and experience had shown to be fitted for ocean voyaging. Their stern was carried high above and overhanging the water to guard the ships against the dangers of a following sea. Along the bulwarks ran a line of shields to protect the crew whilst the bow terminated in a ram, for the Phœnicians were conquerors by ambition and purpose and not rarely were they brought into conflict with the vessels of other people, and to them belong the distinction of the bireme and trireme. Flat bottomed, long and narrow, their vessels sometimes reached a length of three hundred feet, and their speed, either when running before a wind or when propelled by oars, must have been anything but slow. So determined were they to preserve the monopoly of the ocean traffic that they propagated the most exaggerated rumours of the Atlantic Ocean—it was so slimy that no vessel could navigate it, whilst so dead calm that sailing was out of the question. When a Greek ship followed a Carthaginian vessel the captain of the latter deliberately ran it upon a rock in order to deter any further attempt at discovery. Their influence is strongly marked in Homeric geography, there being no doubt that the more distant points noticed such as the Ocean, the Cimmerians, Atlas, etc., were known to the Greeks through the reports of the Phœnician traders. The legend of the Argonautic Expedition was probably founded on these accounts which were thus communicated concerning the wealth of the Euxine or Black Sea and the dangers that attended its navigation. It is the fabrication of many generations, and the route pursued and extent of the voyages were altered and enlarged from time to time to suit the geographical knowledge of the day.

As the Egyptian influence had been handed to the Phœnicians so the ship was handed down by them to the Greeks—the corsairs of antiquity, whose small area was divided by nature's barriers among a number of independent states, many of them containing only a few square miles. But it is not the magnitude of their territory which constitutes the greatness of a people, the heroism and genius of the Greeks having given an interest to the insignificant spot of land which bears their name—vaster empires never equalling it.

Athens, the capital of Greece, established an empire of taste and genius not only over its own nation and age but over the most civilised portion of the world throughout all time. It is supposed to have been founded by Cecrops, a native of Egypt, who introduced the institution of marriage, as well as religious rites and ceremonies, amongst others, the worship of Athene, from which the city derives its name. The city was divided into two parts: the Polis or Acropolis, a central rock 150 feet high with a flat summit 1,000 feet long from East to West and 500 feet broad, and the Asty or City. The Acropolis was the chief centre of the architectural splendour of Athens, after the Persian wars it ceased to be inhabited and was appropriated to the worship of Athene and the other guardian deities of the city, thus becoming covered with the temples of gods and heroes. Its platform presented not only a sanctuary but a museum containing the finest productions of the architect and sculptor in which the whiteness of the marble was relieved by brilliant colours and rendered still more dazzling by the transparent clearness of the atmosphere. It was surrounded with walls and the only approach to it was from the Agora on its western side. At the top of a magnificent flight of marble steps, 70 feet broad, stood the Propylæa which served as a suitable entrance to guard the treasures within, being themselves one of the masterpieces of Athenian art.

On passing through the Propylæa all the glories of the Acropolis became visible, the chief building being the Parthenon, the most perfect of Grecian architecture; and taking into consideration their immemorial antiquity, their astonishing preservation, their grandeur, their simplicity of design—that simplicity in which art generally begins and to which, after a thousand evolutions of ornament, it generally returns—

the Grecian monuments are the most impressive on the earth.

The chief wonder of the Parthenon was the colossal statue of the Virgin Goddess Minerva, executed by Phidias.

The mythology of a people is worthy of record, this being especially true of the Greeks whose legends moulded their character and influenced their life down to the latest times. They believed that their native land was in the earlier ages ruled by a noble race of beings possessing a superhuman though not a divine nature, and superior to ordinary men in strength of body and in greatness of soul, but not exempt from physical pain.

One day Jupiter suffered intensely from a sudden headache, and in hopes that some mode of alleviation would be devised, he summoned all the gods to Olympus. Their united efforts were vain, however, and even the remedies suggested by Apollo, god of medicine, proved inefficacious. Unwilling to endure the racking pain any longer, Jupiter bade one of his sons, Vulcan, to cleave his head open with an axe. The dutiful god did so with cheerful alacrity. No sooner was the operation performed than Athene or Minerva sprang out of her father's head, full grown, clad in glittering armour with poised spear and chanting a triumphant song of victory. She was destined by the gods to preside over peace, defensive war and needlework, to be the incarnation of wisdom, and to put to flight the obscure deity called Dullness who until then had ruled the world.

Soon after her birth an Egyptian founded Athens, and all the gods wished to name this thriving place, but some withdrawing their claims Minerva and Jupiter were left to contend for the coveted honour. So as to evince no partiality Jupiter announced that the city would be entrusted to the protection of the deity who would create the most useful object for the use of man. Striking the ground with his trident a noble horse sprang forth, and its qualities were explained to the admiring spectators. Amid scornful laughter, Minerva produced an olive tree; after she had explained the manifold uses to which wood, fruit, foliage and twigs could be applied, the olive being the sign of peace and prosperity therefore more desirable than the horse, the emblem of war and wretchedness, her gift was acknowledged the most serviceable, and her name was given to Athens. But ever at Jupiter's side, aiding him by her wise counsels, in time of war borrowing his Aegis or shield, when sallying forth with it over her shoulder she aided those whose cause was just, plunging into the thickest of the fray with the utmost valour.

How language is enriched by the memorials of their legends in the words Siren, Circean, Argos, Sphinx, Halcyon, Chimera, Herculean, and what a light is thrown upon the geographical names: Marmora, Hellespont, Bosphorus and Aegean Sea, which afforded them easy communication with each other and the rest of the world. As early as the thirteenth century Greeks vessels sailed over the sea, which they supposed flowed round the earth in a circle and fed the numerous rivers. Its constant motion was usually attributed to the influence of wind. Strabo believed that there was internal agency at work, even during calm weather, analogous to the heaving of the chest in breathing, and that the third and tenth waves were dangerous. The Stoics taught that the ocean lived and explained the rise and fall of the water as the panting of a giant for breath.

Their merchant ships were usually of pine, while the warships were of fir, cypress or cedar. The Grecian shores being rich in timber, red lead, iron and copper, it is not surprising that the shipbuilding industry in ancient times was so extensive. The keels were of oak in order to withstand the rough usage of being hauled ashore every night. Seasoning of the wood was ignored, but the seams were caulked with tow, the top sides being painted green for pirate ships, this colour rendering them almost invisible against the background of the sea. A black sail denoted mourning and a purple one the ship of an admiral or a sovereign. Eyes were painted on them as it was believed that the ship saw her way to sea. This was reassuring, as the mariners had no compass for their guidance as they coasted from one landmark to another. Beyond that all was left to chance and to that natural instinct far more developed in the ancient than in the modern mind.

It is true there was a certain number of lighthouses, and on some parts of the coast high towers were erected so that the flames on them might during the night act as due warning to the navigators, while the smoke in the day time would also indicate the state and the direction of the wind at that point. On entering or leaving a harbour trumpets were blown to give notice of the ship's approach, thus avoiding collisions. Side by side with the commercial there was a great industrial development, and Greek merchants and sailors spread the culture of their people by founding colonies in every part of the known world, Asia Minor, Italy, Sicily, Gaul, Spain and Africa.

The vast number of their colonies, their widespread diffusion over all parts of the Mediterranean, their rapid growth in wealth, power and intellect affords the most striking proof of the greatness of this wonderful people. Unlike the modern colonies, they did not consist of a few straggling bands of adventurers scattering over the country in which they settled and only coalescing into a city at a later period, but they were undertaken by cities and from the beginning formed an organised political body independent of the mother city and emancipated from its control, the only connection between them being filial affection and common religious ties. Thus it is that colonies are favourable to the development of democracy as ancient customs cannot be preserved in a colony as at home. Men are of necessity placed on a greater equality when sharing the same hardships and facing equal dangers. Thus a democratical form of government was established in most of the Greek colonies at an earlier epoch than in the mother country.

Of all natural objects the mountains and the sea have ever been the most powerful instruments in moulding the intellectual character of a people. The Greeks were both mountaineers and mariners, and as such possessed the susceptibility to external impressions—the love of freedom and the spirit of adventure which characterises the inhabitants of such regions. These traits of character, as well as community of blood and language, religious rites and ceremonies, and the Olympian, Pythian, Isthmian, and Nemean games bound the nation together.

The most important of these games were the Olympic games, celebrated every fifth year at Olympia, where a magnificent temple was dedicated to Jupiter. Within it a wonderful statue of gold and ivory stood, its proportions and beauty were such that it was counted one of the seven wonders of the ancient world. The artist Phidias, having completed this masterpiece, longed for some sign of approval from heaven and prayed for a token that the god accepted his labour. In answer Jupiter sent a vivid flash of lightning which, while illuminating the image, left it quite unharmed.

The games were open to all persons proving their Hellenic origin, and comprised boxing, wrestling, jumping, running, throwing the quoit and the javelin. There were also horse and chariot races, the latter with four full-grown horses becoming the most popular and celebrated. Perfect equality prevailed, and the only *reward* the conqueror received was a garland of wild olive, but it was valued as the dearest possession in life. To have his name proclaimed a victor before assembled Hellas, and his statue erected in the sacred grove of Jove, was an object of ambition to the noblest and wealthiest Greek, such a one conferring everlasting glory upon his family and country. His fellow men rewarded him with distinguished honours and he re-entered his native city in triumph and became immune from taxation.

Unfortunately no *political* union existed, the independent sovereignty of each city and state being a fundamental principle of the Greek mind, and unlike the trend of modern thought—that the state exists for the individual, and its objects to secure for him enjoyment of life and property—a Greek lived only for the state and devoted himself, his honour and glory as well as his time and affection, nay more, sacrificed his life and property to its interests, but not to the country at large. This exclusive patriotism rendered it difficult for them to unite in the common cause, leading them to turn their arms against each other and fall an easy prey to Rome.

During the last centuries of antiquity the Greek trade was lost, on account of changes in trade routes, yet in modern times it still retains a certain importance in the trade of the Levant.

How their forms of government and aspects of their national life are commemorated in the words politics, monarchy, oligarchy, barbarian, despot, tyrant, and ostracism—the act of refusing intercourse with a person recalls the method of banishing a citizen considered dangerous to the state. This was done in a public assembly at which the citizens cast into an urn " ostrakon," or a shell, on which was written the name of the person to be banished. A demagogue was a leader of the people; and an idiot, one who took no active part in the duties of citizenship.

The Eastern coasts of the Adriatic Sea were explored by the Romans during the Illyrian War, 230 B.C., its object being the extirpation of the hordes of pirates who had until that time swept the coasts of Italy. Piracy has always been the scourge of the Mediterranean Sea from the earliest ages, North Africa being a nest in later times of the fiercest pirates. The Venetian chronicles are full of complaints of piratical ravages, and there is no other name but piracy for such acts as the unprovoked pillage of Tripoli by Andrea Doria in 1535. But to form a just idea of the corsairs of the past it is well to remember that commerce and piracy were often synonymous terms, judging by the following remarkable declaration of a pious commercial navigator of the globe:—" It hath pleased Almighty God to suffer me to circumpass the whole globe of the world. I navigated along the coast of Chili, Peru and New Spain, where I made great spoils. All the villages and towns that ever I landed at I burned and spoiled and had I not been discovered upon the coast I would have taken a great quantity of treasure," and then he piously concludes: " The Lord be praised for all his mercies."

Venice was the European centre of the caravan route to India, which passed through the present Hungary to Phœnicia, where the products of Asia and Europe were exchanged and forwarded to their various destinations. From Phœnicia by the course of the Oxus to the Caspian Sea, thence by Herat and Cabul to the Indus, then either down the course of that river or across the valley of the Ganges to the shores of the Bay of Bengal. It was founded by the Veneti who fled from Aquileia, Padua and other towns on the Adriatic before Attila, King of the Huns. A more miserable helpless plight than theirs could hardly be imagined, and yet out of their slender resources they built Venice, the sand-banks which they contested with the sea fowl becoming the site of a great and wealthy city, their fish and salt forming the original basis of a world-wide commerce. The first was their only food, the second their one treasure, being transported to the mainland and bartered for food and clothing, and most important of all, wood for ship-building. Through being unable to stir except by water they became the most expert seamen, their ships visiting all the harbours of the Adriatic Sea. Later, gaining confidence, they pushed out into the Mediterranean, opening up trade with Greece and Constantinople, thus becoming the port of Italy and Germany. Every year their ships became larger and more numerous, war galleys also being kept cruising in different directions for the protection of Venetian commerce. The famous Bucentaur, with its exterior of scarlet and gold, its long bank of burnished oars, its decks and seats inlaid with precious woods, the gorgeous canopy and throne, recalled the magnificent Cleopatran barge. It was in this vessel that the Doge, or Duke of Venice, went annually, on Ascension Day, in state to celebrate the marriage of Venice with the Adriatic Sea, by dropping a ring into its waters. Several manufactures were combined with Venetian commerce, the sands providing the material for that exquisite glass, so pure and yet so rich in hue with which their name is still associated. There were also brass and iron foundries—the armourers of Venice being widely celebrated for the strength and beauty of their weapons, breast plates, helmets, bucklers, and their gorgeous cloth of gold was in great demand in the courts of France and Germany. The city was then, as it is now, intersected with canals, studded with churches, gondolas skimmed rapidly along, merchants assembled on the Rialto—a bridge between the Island of Rialto (whence Venice first sprang) and that of St. Mark.

The Bank of Venice was the first institution of its kind ever established, its credit being guaranteed by the state, and attested the wisdom and commercial enterprise of this city of the waters—" The Queen of the Adriatic."

Genoa and Venice were two deadly and relentless enemies, and in 1261, through the Venetians being excluded from the trade of the Black Sea, a war ensued, Venice emerging triumphant, but alas the object of the struggle was lost to the victors and vanquished alike by the intervention of the Turks, who imposed their paralysing influence on the commerce of those parts. Within the Mediterranean Venice remained without a rival, the blow fatal to her influence came from without, unexpected and inevitable—the discovery of a sea passage to India.

Italy was united by the Romans politically and linguistically, yet they did little for geography as a science, nevertheless practical geography was benefited by the extent of their conquests and by the manner in which the vast dominion under their charge was systematised and consolidated by means of that great network of military roads which united its remotest borders. These roads were made for defence, but when a defending power is worsted roads facilitate attack, and thus it was that barbarian hordes made repeated raids into the Empire, advancing to its very heart in the fifth century, ultimately overthrowing it there.

Italy's struggle with Carthage for the supremacy of the world led to the Punic Wars, the first being a struggle for the possession of Sicily, and with it was lost the possession of the sea which hitherto had been uncontested. Sicily was in the earliest ages the chief seat of Phœnician and Grecian colonisation, and as long as the civilised world consisted only of the lands round the Mediterranean Sea, Sicily was the very centre of that world. Its position invited settlement from every quarter, its size allowed settlement from many quarters at once, and it therefore became the battlefield of many nations and powers, the issue being: Shall this great central island of three continents belong to the East or the West? Shall it be part of Africa or Europe? It has been twice fought for by Aryan and Semitic races, and in both cases the geographical relations of the struggle have been strangely reversed, in the struggle between East and West the East has become West and the West East.

The second Punic War resulted in the utter prostration of Carthage and the loss of all her possessions, and in 201 B.C. Rome became mistress of the world.

The destruction of Carthage was a heavy blow to Mediterranean commerce, reconstruction being vastly more difficult than destruction, for although a new Carthage was built on the site of the old city by Augustus, he could never attract again the trade of the Mediterranean which had been diverted into other channels. Roman supremacy was unfavourable to the growth of commerce, for although unrestricted trade was allowed throughout its vast empire and was aided by improved internal communication, no less than four passes being opened over the Alps, Rome itself absorbed the greater part of the wealth and did not produce any commodities in return. After the conquest of Carthage, Greece, Egypt and the East poured their riches into Rome, thus dispensing for a time with the needs of productive industry but leaving no enduring basis of prosperity.

On the whole Sicily, called by the Romans Trinacria, or three pointed, declined under their rule, great evils resulting from the excessive cultivation of corn, and the tilling of the land by slaves; indeed their wars are the most important incidents in the history of the land.

Sicily is redolent of mythology. It was the home of Arion, the God of Music, who on one occasion departed in a ship manned by an avaricious piratical crew, who determined to murder him and secure his treasure. He was allowed scant time for death, but just as they were about to fling him overboard he craved and obtained permission to play for the last time. His clear notes floated over the sea and allured a school of dolphins which came and played about the ship. The pirates, terrified by the powers of his music, quickly hurled him into the water where he fell upon the broad back of a dolphin which bore him in safety to the nearest shore. To commemorate this miracle the gods placed Arion's harp, together with the dolphin, in the heavens where they form a constellation.

Here too Vulcan withdrew to the solitudes of Mount Etna, where he established a forge in the heart of the mountain in partnership with the Cyclopes, who helped him to manufacture articles of metal and the dreaded thunderbolts of Jupiter, besides the construction of golden palaces for the gods, fashioning their furniture from precious metals and embellishing his work by a rich ornamentation of precious stones.

Enceladus, a renowned giant, was conquered by Jupiter, bound with adamantine chains in a burning cave under Mount Etna. In early times before he had become accustomed to his prison he gave vent to his rage by outcries, imprecations and groans, sometimes he even breathed forth fire and flames in hopes of injuring his conqueror. But time, that great healer, has cooled his resentment, and he is now content with an occasional change of position which, owing to his huge size, causes the earth to tremble over a space of many miles, producing what is called an earthquake.

Etna is connected with Vesuvius by Stromboli in the Lipari Islands. Strabo, writing in the time of Augustus, describes the slopes of Vesuvius covered with beautiful meadows and more than once made the stronghold of Roman armies, Spartacus escaping from his pursuers by climbing to its summit. In the reign of Nero, A.D. 63, an earthquake severely damaged Pompeii and Herculaneum, and in A.D. 76 the first recorded outbreak of lava occurred, the country around being destroyed by showers of ashes and streams of lava, the peak of Vesuvius being then formed.

The entire destruction of Pompeii and Herculaneum occurred at this time. Pliny the elder, uncle of the younger Pliny, one of the wisest and most intelligent men of his time, was ignorant of the nature of this awful visitation, and was in command of the Roman fleet in the Bay of Naples in full view of Vesuvius. Wishing to discover the reason of such unusual phenomena and to render assistance if possible to the neighbouring towns he ventured on land. Alas! in a moment he was enveloped in the deadly vapour and perished a victim to the thirst for knowledge.

It was a wonderful piece of good fortune that the catastrophe should have been witnessed by one who had the power to describe it graphically—the two letters written by Pliny the younger to Tacitus being amongst the most remarkable examples of Roman literature.

Pompeii stood on the south side of Vesuvius and was a favourite situation for the country houses of the Romans. Literally the people danced on a volcano, although Strabo and other eminent scholars had issued their warnings disregarded, for geology did not interest the Romans and the Pompeians would have been unable to distinguish a calcareous rock from a volcanic one. In fact, they did not wish their mountain (La Somme), about which their poets sang as the source of wine made by the gods, to be considered dangerous. When destruction burst upon them, the town was assembled to hear Nero himself conduct the famous cantata which he had composed, with a choir of 500 voices accompanying his voice. Whilst admiring the grace and ease of the renowned artist, the building gave way. Not wishing the music to be interrupted Nero, with his usual selfishness, forbade exits, and consequently many were buried in the ruins, he himself being rescued with great difficulty.

Pompeii once seen is never forgotten, for nothing conveys a loftier conception of the grandeur, might, wealth and civilisation of the Roman Empire at its most flourishing periods than the provincial towns.

It is not the public buildings of Rome itself, enriched as they were by the spoliation of Greece and Egypt, and unequalled as they are for vastness and magnificence, which impress one most with her former power, such monuments might be expected from those who peopled the capital of the world. The Romans were the first to barbarise Grecian Art (just as the present system of quarrying marble at Carrara has barbarised the skill and dexterity evinced by the ancient Egyptians in cutting stones), and modern nations have barbarised themselves by copying their tasteless decorations. Single columns are stuck up all over Europe to commemorate persons or events. As parts of a building they may be very beautiful, but as parts only. Religion prompted the building of Greek temples, ambition prompted the Romans to hand down their conquests to posterity.

But it is the third or fourth class towns, such as Pompeii, with its two theatres, its amphitheatres, its temples, all upon a scale of singular splendour, adorned with hundreds of statues in bronze and marble, that fill the mind with wonder and enable one to form some conception of the greatness and power of that mighty people. Even after the fall of the Roman Empire, the linguistic and intellectual individuality of Italy was never lost, and in the Middle Ages Italian influence on the rest of the world, on account of the power of the Pope in the Roman Catholic Church, was hardly less than in Roman times.

This being so it is not surprising that men's religious opinions, which concern their most vital interests, should exert a powerful influence on their conduct; religion being one of the main motives of the Crusades, which exercised a powerful influence on civilisation by engaging different nations in one common cause, fostered the spirit of chivalrous enterprise and brought into close contact the East and the West.

It is from this time that English commercial intercourse with the Mediterranean commenced, and in 1522 it was so great that a Cretan merchant (Censio de Balthazzari) was appointed the first English consul by King Henry VIII, "to be master, governor, protector, and consul of all and singular, the merchants and others, his lieges and subjects, within the port, island and country of Crete or Candia."

Italy may be said to be the cradle of navigation, the mariner's compass was invented by Marco Polo, a Venetian traveller and explorer. It was floated originally on straws in water until 1302 when Flavia Gioga of Naples, suspended it freely on a fixed point, thus paving the way for Columbus' discovery of America in his ship the "Santa Maria," with her three masts, square rigged on both fore and main, but with lateen on her mizzen, a slow and a bad sea boat. She carried but one topsail above her main sail and no others except the square sprit sail set across and below the bowsprit. About the time of the Chicago exhibition the American authorities sent over to Spain and inquired if by any chance the plans and specifications of Columbus' ship were still in existence. Search was accordingly made in Cadiz dockyard where the necessary documents were discovered among the archives, and she was then rebuilt actually timber for timber, bolt for bolt, as she had been 400 years before.

Great as the world's admiration for this intrepid discoverer has ever been is it not enhanced a thousand times when viewing the ship in which he sailed into the unknown? Posterity need not marvel at his courage, his home was Genoa, on the great commercial highway to India, and also on the maritime road to France, the military exploits of Hannibal would be familiar, and the spirit of adventure that breathed around the Gulf of Lions would be imbued in him. Doubtless too the tales of travellers who conveyed the tin, shipped from Britain to Gaul through the valleys of the Rhone and Saone to Marseilles, would have fired his zeal to search for the lands—of which he had heard so much.

Spain was from Phœnician times the classical land of mining, but the incursions of the Moors had a much deeper influence on the country, introducing a high state of civilisation, their architecture being the wonder and admiration of the world, their irrigation works have never been improved upon, they fostered literature and the arts of peace, and introduced a system of agriculture far superior to that before their arrival.

Commerce, discouraged by the Romans, was highly honoured by the Moors, and under their sway the Mediterranean recovered the trade which it possessed in the time of the Phœnicians and Carthaginians, it penetrated into the Indian Archipelago and China to the Niger and Madagascar, and thus the great trade route of the Mediterranean was once more established.

Portugal, as a part of the Spanish Peninsula, was thus familiarised with the luxuries of the East, and when their supply was cut off by the war with the Moors, inspired perhaps by the constant vision of the rolling ocean, their fighting instinct roused by being confined to a narrow isolated strip of land, how natural it was that their attention should be directed to the navigation of the Atlantic, thus stimulating the maritime enterprise of Bartholomew Diaz and Vasco di Gama. To commemorate the discoveries of the latter, Manuel I built the Castle of Belem, which defends the approach to Lisbon, and honoured him by placing his body in its cloisters among the great.

It was during his travels that Hercules, after crossing the Alps, arrived at Gibraltar; with one wrench of his powerful arm he tore a cleft in the mountains thus allowing the waters of the sea to flow in, and from that time the rocks on either side the Strait of Gibraltar have borne the name of the Pillars of Hercules. They have appropriately been named "The parting of the ways." On the one side the influence of the East, on the other the influence of the broad rolling ocean.

Beyond it was the Dark Sea, and as darkness was naturally connected with the subject of death, here consequently Homer placed Elysium, the abode of the blessed, and the entrance to Hades, the former on the Mediterranean side and the latter on the Atlantic side of the Pillars of Hercules.

Here Pluto sat in state, and from the foot of his throne flowed the rivers which channelled the Lower World.

The Coctycus was composed of the tears of the criminals condemned to hard labour in that portion reserved for the exclusive use of the wicked.

The Acheron was a deep and black stream which had to be crossed by all, while the waters of Lethe made all unpleasant things be forgotten, and thus prepared the good for a state of endless bliss in the Elysian Fields which were far out of sight and hearing of the pitiful sounds which so constantly rose out of Tartarus, being lighted by a sun and moon of their own, decked with the most fragrant and beautiful flowers and provided with every charm that nature or art could supply.

To prevent all mortals from entering his region, and all spirits from escaping, a huge three-headed dog (Cerberus) was placed to guard the gate, and through Hercules, removing him from and returning him to his post, mankind is now permitted to enter but not to return.

One cannot but contrast ancient Spain—supplying the Old and New World with the precious metals, herself the Peru of antiquity, enriching Tyre and Sidon, as in later times she supplied Europe through her trans-Atlantic possessions, the mistress of the world—with the modern Spain, for despite her splendid position for commerce, the Spaniards take little part in the commercial world.

The Portuguese became famous through their bold adventurous genius, reaching the height of their glory when destroying the commercial supremacy of Venice. That history strangely repeats itself may be applied to them, as the present form of government is similar to that of 1640. The whole of the ancient Empires are an example of how many times in the world's history the wave of civilisation and intellect has been swept back by the material progress of those less-civilised, more warlike, more energetic and determined to make room for themselves. Thus races have succeeded races on the shores of the Mediterranean Sea.

The Atlantic is the pathway of the Danes, a brave and unscrupulous race inhabiting Denmark and Norway. Bound to a limited territory in a climate where population rapidly increases, it is not to be wondered at that large colonies were sent away. Their natural inclination to a sea life made these exiles abandon their country more readily, and the great booty the first adventurers gained tempted the richest and most powerful of their countrymen to seek their fortune in the same manner, to which end they entered into association and fitted out large fleets to seek and ravage foreign countries, becoming entirely devoted to this mode of life, having the authority and example of their leaders the Sea Kings. They devastated several parts of Europe, particularly France, England and the Low Countries, and it is only from their Sagas that the extent of their wanderings and exploits may be gained.

Their ships were of oak and of greater seaworthiness than those of the Latins, indeed their proficiency in shipbuilding is remarkable. Their gaily-coloured sail was square in shape, much wider along the foot than along the yard, exceeding the breadth of the ship, being made of flax strengthened along the edge with hide, sometimes striped, embroidered, or made of velvet by the more delicate hands of their women-folk. Stripes of red and blue, purple and gold with quaint patterns depicting some historical incident were added as a relief to the white canvas.

At the bow rising well above the hull was a dragon's or serpent's head for a device.

A single row of oarsmen was on either side protected by shields from the enemy's darts, the handles being decorated; the tiller head was also carved with great taste. There were five separate compartments, a gangway down the centre, the bow section divided in two, where the pick of the crew were placed to prevent the boarding of the ship by an enemy. Here also was the standard bearer. The whole ship was beautifully built and designed with an admirable knowledge of naval architecture—even according to modern minds.

While the vessel was under sail, the holes for the oars were closed with wooden shutters to keep out the water. At night a tent was stretched across the vessel and kept open by wooden stretchers, the crew sleeping in their leather sleeping bags beneath it.

Their favourite mode of burial was to place the body of the great sea king in his ship, haul it ashore and after his possessions, his horse, dog, and weapons had been placed by his side, a sepulchral chamber was built over it and an enormous mound erected over all.

It is to these people with their practical yet imaginative character, real and ideal, who plundered, settled in and conquered Britain that the English of to-day are indebted for their laws, literature and national character, and greater than all, the command of the sea. But although we sing "Britannia rules the Waves," the ocean does not acknowledge his subjugation but exacts annually an appalling toll in lives and lands. A pilgrim to our era from the court of King Arthur (Tintagel Castle being the birthplace of Arthurian legends), as his eye swept wistfully the coasts in search of familiar towns, villages, castles, churches and forests, would have deep reason to complain of the fearful and wholesale inroads that have swept away the mines and all traces of the Phœnician trading settlements, but the Mediterranean influence remains in the place names—Hartland Point named after Hercules, and Start Point after their god Astarte or Ashtoreth. Pen and Tre, so common in place names—Pen from Phœnician Pennah, a hill.

My own land too (the Isle of Man), has its claims on ancient history, being mentioned by both Pliny and Cæsar in their accounts of the world.

Like Cyprus, Crete and Sicily, its central position caused it to become the battlefield of nations. Its present coat-of-arms was introduced from Sicily in 1270, and its myths and legends show a marked resemblance to those of the ancients, the " Spectre Hound of Man " being mentioned by Holinshed and utilised by Sir Walter Scott in his illustrious work "Peveril of the Peak."

The past is intelligible to us, and the world of to-day has benefited by the experiences of the ancient Empires in their infancy, growth, and maturity. The architecture of the Egyptians has never been equalled, Seneca cannot be approached as a thinker, the military prowess of the Romans has never been surpassed, and the world has not produced a more intrepid explorer than Columbus. Yet the future is ever springing out of the present and becoming the past, but knowing that every stage in the history of nations follows in due sequence upon the previous one, coming not as an accident but prepared for, the waves of civilisation dashing against the shores of time may be viewed with equanimity, although they sweep away some relic of the past it may be making room for the improvements of the present, the carving out of a great destiny, or laying bare some hidden treasure, thus paving the way for a prosperous and glorious future.

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"SOME THOUGHTS UPON ICELAND."

By the Rt. Rev. Bishop Welldon, D.D., *Dean of Manchester.*

(Summary of a lecture delivered to the Society in the Geographical Hall on Tuesday, October 8th, 1912.)

"Ultima Thule."

There is a Danish legend that, when God had finished the work of creation and had seen that it was all very good, the devil, being moved with envy, thought he would try his hand too, after the Divine example, at creation, and the result of his creative effort was—Iceland. The Danes are not perhaps over-indulgent critics of their Icelandic Dependency; for ever since Iceland came under Danish rule in 1387 A.D. it has been something of a thorn in the side of Denmark. I do not like to say that Iceland has been the Danish Ireland; fortunately it does not lie so near to Denmark as Ireland to Great Britain; but the Icelanders have been and are a sturdy, independent people, and not a few of them are Home Rulers at heart, as I seemed to perceive when the guide who escorted me to the Public Library in Reykjavik told me, if, indeed, I understood him aright, as he pointed to the bunting displayed on the official buildings of the city, what a hardship it was that the Icelanders were compelled to fly the Danish national flag instead of being permitted to fly their own.

But if Providence has not upon the whole dealt kindly with Iceland in respect of physical scenery or climate, the Icelanders have managed to carve out an original and interesting history for themselves. When the island first emerges into the light of day, not long before 1000 A.D., it was governed by a number of hereditary chiefs who held their assemblages or parliaments from time to time in the valley known as Thingvellir, or "The Plain of the Council." But civil war broke out among the chiefs of the 13th century, and one of the contending parties sought the help of Hákon, King of Norway. It proved easier, as has happened elsewhere than in Iceland, to call in a foreign sovereign than to turn him out; and at the close of the civil war

Iceland found itself annexed to Norway. The ancient Icelandic Commonwealth, which had lasted some 400 years, then came to an end. A century later, when the kingdom of Denmark absorbed Norway, it absorbed Iceland too.

But the Danes understood the needs of Iceland no better than the English have understood the needs of Ireland. They governed the island in the interest of Denmark; they established Danish commercial monopolies; they abolished the ancient Icelandic Parliament or Althing; they transferred the seat of government from Skálholt to Reykjavik. Not until the latter half of the 19th century did a more intelligent, sympathetic spirit prevail in the relation of Denmark to her unfortunate Dependency. The present constitution of Iceland, under which the resuscitated Althing meets biennially at Reykjavik, dates from 1874. Between 1874 and 1904 Iceland was administered by a Governor-General, who was responsible to the Danish Government. But even so the Icelanders were not content. On January 1st, 1904, Iceland became a province practically independent under a minister for Iceland who is responsible to its own Parliament and with no control upon the legislative power of its Parliament except the veto of the King of Denmark—a veto which has never yet been brought into play. Since 1904 the Althing has pursued a strong radical policy. It has lately conferred the political franchise on all adult citizens, male and female alike. It has, I was informed, resolved to prohibit in and after the year 1914 not only the importation but the manufacture and sale of all alcoholic drinks, except for medicinal purposes, within the whole island.

When the great division of Christendom took place in the 16th century, Iceland, like all Scandinavia, went over bodily to the reformed faith. It became Lutheran then, and it remains Lutheran to-day. I travelled out to Reykjavik with an agreeable priest, who has for some years been placed in charge of a small Roman Catholic Mission: but he was not a native of Iceland, and I was told that he was engaged in an up-hill work. Yet it has often seemed strange to me that the Reformation which hardly succeeded in penetrating to some parts of Scotland, or even of Lancashire, should have swept with an irresistible tide over all Scandinavia, and even over Iceland and the Faroes.

I was anxious before visiting Iceland to learn as much as possible about the country. But the most popular English books upon Iceland are a little out of date. Lord Dufferin visited Iceland in 1856, the Rev. Sabine Baring Gould in 1862, and Sir Richard Burton in 1871. Of Lord Dufferin's well-known " Letters from High Latitudes " it is impossible to speak without an acknowledgment of the scintillating humour which illuminates his careful observations; the speech which he professes to have delivered at the dinner given him in Government House at Reykjavik remains a masterpiece of Canine Latinity. Sir Henry Holland, the celebrated physician in the early Victorian days, paid two visits to Iceland, but the narrative of his visits in his " Recollections of Past Life " is strangely meagre, and perhaps the most remarkable feature of them is that there was an interval of sixty-one years between the two visits. Even the useful books of Mr. Coles and Mr. Lock represent the experiences of thirty years ago. Murray's Hand-book is still more behind the times. Some of the most accurate information relating to Iceland may be found in a series of four articles contributed by the late Mr. J. R. Newby to the *Journal* of the Manchester Geographical Society in 1900 and 1901.

The result is that, in spite of Mr. Hall Caine's rather superficial work " The Prodigal Son," the Iceland of fifty years ago is better known to the English world than the Iceland of to-day. The difficulty of travelling is exaggerated. No doubt there is no railway, and there are not many good roads, in Iceland; but most travellers are not explorers, and at least in the south-west of the island it is possible to visit Thingvellir and the geysirs, and perhaps Mt. Hekla, or the Hafnar-Fiord and the great lava-field without any necessity for swimming rivers on horseback or fording streams or camping out in the open air. Most Icelanders, too, speak a little English; some of them speak it well, although the Bishop of Iceland, upon whom I called, rather strangely preferred to talk German; but the English which they speak is taught them by their compatriots in the schools, and veracity compels me to allow that it is sometimes more easily intelligible to an Icelander than to an Englishman.

To the student of Icelandic history no site in the island is more interesting than Thingvellir. It is a day's ride or drive from Reykjavik along a fairly good carriage-road. It is the place where for nearly 1,000 years, from 929 A.D. onwards, the hereditary chiefs of Iceland met in Parliament, to enact the laws of their country. There is thus some ground for the assertion, which has been rather paradoxically made, that it is Thingvellir and not St. Stephen's which might justly claim the proud title of "the Mother of Parliaments."

Nowhere, so far as my memory helps me to judge, has human prescience so wisely utilised the majestic character of natural scenery to produce a moral or spiritual effect upon human minds as Thingvellir, except perhaps at Delphi; and the scenery at Delphi, imposing as it is, is far less spacious and awful than at Thingvellir. As the traveller approaches the historic valley he catches sight of the sombre Thingvellir Lake, spreading for forty square miles beneath the shadow of dark hills; then he enters the precipitous ravine called the Almannagjá, or "the Ravine of All Men," where he rides for more than a mile beneath a towering mass of battlemented volcanic rocks, with the torrent of the Oxará leaping at one point in a waterfall over a fissure in the rocks and cutting its way, not without clear deep pools, beneath the precipice. It is not until he emerges from the ravine that the wide plain of Thingvellir bursts upon his view; he sees the little church and the hostelry, and far away the snow lying in patches on the distant hillsides, and the jets of steam ascending from the hot springs on Mt. Hengill.

It was here that the laws of Iceland were promulgated. After each session of the National Parliament the President took his stand upon a projecting rock which is still called the Lögberg or "Hill of Laws"; the people gathered opposite to him on or under the Almannagjá, where the background of rock made a sounding board for his speech; and on that Hill of Laws, corresponding to the Tynwald Hill in the Isle of Man, he publicly and formally declared the laws, or the changes in the laws, of Iceland. The great Icelandic poet of the Sagas, Snorri Steluson is believed to have spent a part of his life at the foot of the Lögberg.

Every one who has read the appendix contributed by the late Professor Newton to Mr. Baring Gould's "Iceland: Its Scenes and Sagas," knows how great is the interest attaching to the ornithology of Iceland and the islands lying off its coasts. It was on Geirfuglasker, an island near Reykjanes, that the last great auk was shot by some thoughtless farmer sixty years or more ago. Swans, geese, duck, teal, plover, snipe and grouse are plentiful. There is reindeer-stalking;

but it is limited, I think, by law to fourteen days, beginning with September 15th. There is whale-fishing in the firths of the north-west. M. Pierre Loti's "Pêcheur d'Islande" has familiarised many readers with the cod-fishing industry which is carried on by French fishermen from Brittany. Iceland, too, is the paradise of salmon-fishing. I heard of two English fishermen who had gone home this year by an earlier mail-boat than they had intended, as their appetite for sport had been already glutted by the trophies of their rods. An excellent Láxa, or salmon river, flows within a mile or two of Reykjavik. But the most enthusiastic of sportsmen will not regret the protection afforded by law all the year round to one native denizen of Iceland, the beautiful eider-duck, which plucks the down with its beak off its own bosom to make a nest for its young, and if it is robbed of its first supply of down, will pluck out another and yet another, until it is so sorely exhausted and exposed that it often dies. Under Icelandic law a man may not kill an eider-duck unless he is on the verge of starvation.

It may be interesting to add that the famous chapter upon "Snakes in Iceland"—a chapter which is sometimes quoted as though it had been written about Ireland, probably with reference to the legendary exterminating zeal of St. Patrick against reptiles—actually occurs in Horrebow's "Natural History of Iceland." The whole chapter runs as follows:—

> "Chapter LXXII.
>
> "Concerning Snakes.
>
> "No snakes of any kind are to be met with throughout the whole island."

and the chapter is as true as it is terse.

* * *

RHODESIA PAST AND PRESENT.

By Gerrard de Hochepied Larpent, B.A.,

(A Summary of a Lecture delivered to the Society in the Geographical Hall on Tuesday, February 25th, 1913.)

Rhodesia is in area rather more than seven times the size of England and Wales—only a little less than the total extent of the four colonies, Transvaal, Orange Free State, Natal, and Cape Colony. The greater part of Southern Rhodesia is a well-watered plateau, over 4,000 feet above the level of the sea, which accounts for its splendid equable climate, with no extremes of heat and cold, salutary for European men, women and children.

About 400 years ago the Portuguese, fired by rumours of the traditional wealth of the Hinterland, gained a footing at Sofala and on the banks of the river Zambesi. Beyond that one conspicuously great pioneering effort the Portuguese settlement was without stability, and its occupation, except on the sea board, practically without influence. The travels of Livingstone struck the first note of British enthusiasm for opening up Central Africa, and the genius of Cecil Rhodes acquired for his countrymen the wide-stretching healthy tablelands of Rhodesia at the time when the scramble among the European nations for the partition of the Dark Continent took place. Many romantic associations and theories are connected with the ancient ruins, whose origin is lost in the mist of ages, and with the quaint paintings of the pigmy Bushmen that occur throughout the country and as specimens of primitive art show remarkable correctness of drawing and skilful imaginative treatment. The pioneer column of 1890 was confronted with the perilous task of occupying Mashonaland under the eyes of a host of warlike savages, whose resentment at the prospect of being deprived by the white men of their time-honoured prerogative of rapine and murder at length burst out unchecked. Swiftly the little band of settlers took action with the result that Matabeleland was annexed and the two

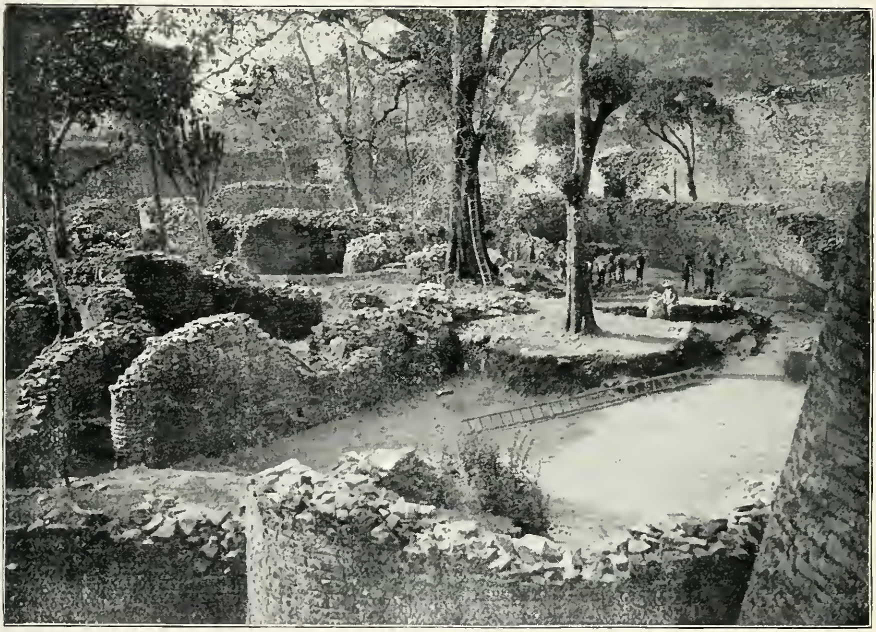

Fig. 1. Rhodesia. Zimbabwe, Interior of Elliptical Temple.

provinces were merged under the one administration and given the name of Rhodesia in honour of Mr. Rhodes.

It was obvious that for the safety of the citizens and for the effective occupation and development of the country, railway communication with the south was indispensable, so with feverish haste the extension of the line from Cape Town was proceeded with, until, three years later, the train steamed into the fair city of Bulawayo which had sprung up from the ruins of Lobengula's "scene of slaughter."

From its earliest days Bulawayo advanced with the most extraordinary rapidity. The confidence of the people in the future took the practical shape of numbers of handsome buildings which sprang up from what a few months before had been a Kaffir village.

A less ambitious man than Rhodes might have paused and cried halt! enough! But no sooner had the conquest of Matabeleland become assured, than the great project of the Cape to Cairo railway and the trans-continental telegraph began to crystallise in Rhodes's mind. He pictured a great main artery through which British blood might pulse from north to south, bringing light into the deepest recesses of darkest Africa, dominating the commercial, moral and political situation.

Salisbury was linked up with the coast from the port of Beira, and extension to the north naturally took the way of the coal deposits of Wankie and the Victoria Falls, and pressed on until the line eventually arrived at the Congo border, and was still further extended to the present terminus of Kambove in the huge copper-mining district of Katanga.

Beira is the official port for Rhodesia, and about seventy per cent. of the Rhodesian goods traffic passes over the Beira railway. By the terms of the railway concession the Portuguese simply collect, on behalf of the railway, three per cent. *ad valorem* duty levied on goods in transit to Rhodesia, and therefore no vagaries of export or import duties need be feared.

The Pungue is the only river with a deep water channel and secure anchorage for large ships between Lorenzo Marques, about five hundred miles to the south, and Mozambique or Pemba Bay, about six hundred miles to the north. Beira, therefore, has the monopoly as the outlet for the entire trade of a vast Hinterland. Owing to heavy mortality of Europeans during the construction of the pioneer narrow-gauge railway the name of Beira throughout South Africa has been vilified as a death-trap. This is entirely incorrect. The low-lying valleys of the Pungue and Busi rivers are better avoided, but for six months in the year the climate of the town of Beira itself leaves little to be desired; a cool sea breeze springs up in the afternoon, and the tides sweep right round the town, up the backwater of the Chiveve creek.

Many Europeans have lived in Beira quite healthily for years. It is gradually becoming the fashion for Rhodesians to use Beira as a health resort, and to come down to the coast for a breath of sea air, a fish breakfast, and a round of golf, on a course that is second to none throughout the whole of South Africa.

Besides the existing railway to Salisbury, there is every possibility of a railway being built in the near future from Beira to the Zambesi, there to connect with the existing Shire-Highland line. This line will assist greatly in the development of Northern Rhodesia.

Railway development in Rhodesia means that what used to be a day's journey can now be completed in an hour. The transport of one ton of goods from Beira to Salisbury used to cost £110 and now averages £10, while the return freight from Salisbury to Beira for agricultural products is $\frac{1}{4}$d. per ton per mile, or 7s. 10d. for the 374 miles. Cheap rates to the coast not only fill trucks, which would otherwise return empty, but in offering substantial encouragement to the settler, and thereby fostering enterprise, increase the up-country traffic also.

Prominent among the agricultural products that may be expected to swell railway freights from Northern Rhodesia to Beira is cotton. On the banks of the Kafue river cotton-growing is already developing into an industry of some commercial importance. The British Cotton Growing Association, in combination with the Chartered Company, have established a cotton ginnery near the Kafue bridge, and the services of a resident expert are at the disposal of the cotton growers, among whom is numbered His Grace the Duke of Westminster. For four hundred miles the Kafue river is navigable, and for twenty miles on either side are stretches of alluvial soil which here and there is silted over every year, and its fertility renewed by floods which collect on the Katanga watershed and descend

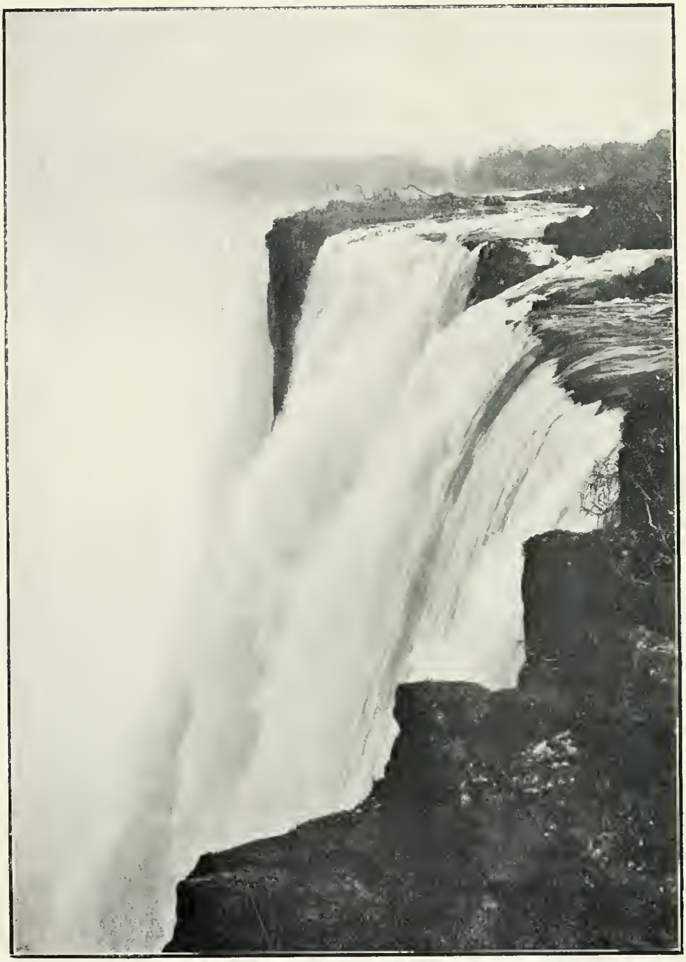

Fig. 2. Rhodesia. Victoria Falls.

in mighty overflow similar to the annual rising of the waters in the Nile valley.

Mines. Rhodesia is now the steady producer of some two and three quarter million pounds of gold per annum, and there are ample deposits of coal, chrome iron and other valuable minerals. It is emphatically a country for the small man as well as for the wealthy capitalist.

The octopus-like formation of the gold schists grips the Rhodesian plateau at several points with irregular feelers. The influence of this extended spread of mining activity is already affecting the distribution of the population of Southern Rhodesia into small townships, and each mine or group of mines forms a local market for farm produce, which reacts on the value of land over a larger area and tends towards the wider expansion of agricultural interests.

But it is not only the romance of the mines which is attracting population from the Mother Country. There is more wealth in the soils of Rhodesia than there is in all the mines below the surface. Owing to its fertile soil, regular wet season, ample rainfall, genial climate, and cheap land, Rhodesia offers prospects for successful farming operations second to none in South Africa and comparing favourably with most British colonies.

The rainfall averages 28 inches over the whole of Southern Rhodesia. During the wet season, October to April, a wide variety of crops can be grown. Under irrigation a second grain crop, such as wheat or barley, can be raised and harvested during the dry season, which extends from May to September.

Maize. The staple crop of Rhodesia is maize which in quality is capable of reaching a very high grade of perfection. Should supply exceed local demand an export trade is possible owing to the fact that geographically the Rhodesian farmer holds a strong position with regard to the London market when competing with the farmer in Western Canada or up-country in Australia.

But it may be asked "How about the locust?" The Rhodesian farmer has discovered a simple and effective method of dealing with the locust and discounting the devastation caused to growing crops. He merely plants his maize a month later than he was wont to do in previous years, the result being that supposing a swarm of locusts arrive on his land the insects, instead of obtaining a good feed off a well-developed plant, which would droop and die after the operation, merely eat off the young shoots just issuing from the ground. The maize renews its vigour as soon as the locusts have departed, and springs up as it were in derision of the vindictive visitor. Energetic measures have been taken to destroy this pest.

Cattle. However opinions may differ as to the agricultural possibilities of Rhodesia, most men will endorse the words of a celebrated Scottish authority who states that:—"As a grazing country for cattle during the period of rainfall and luxuriant growth Rhodesia has no equal in South Africa, and it would be difficult to find her superior in any part of the world."

The well-known Argentine firm, the Liebig Company, proprietors of Lemco and Oxo, have started a ranch in Southern Rhodesia, which in itself is a testimony to the excellent pasture of the country. Ranching on a large scale has also begun in Northern Rhodesia, on the banks of the Kafue.

Tobacco. As a tobacco-growing country Rhodesia early attracted attention, and is already regarded as a rival to Virginia and Turkey. Rhodesian tobaccos obtained a gold medal at the International Tobacco Exhibition held in London 1908, and since then have borne away honours from several South African open competitions.

The locust is considerate enough to avoid the tobacco leaf as an article of diet. This immunity is fortunately also enjoyed by the orange and the lemon tree.

Oranges. Wherever orange-growers exist on a commercial scale, as in California, Florida, and the Mediterranean, the returns are exceedingly profitable. In favour of Rhodesia there are several factors which should make for success, especially cheap labour, no absolute need for irrigation, and a special season for marketing the fruit. Being in the southern hemisphere, Rhodesia can bring fruit into Europe as early as July, a time when there are no serious rivals. The few small sample shipments that have been tested by London and Glasgow fruit brokers have been pronounced excellent in taste, quality, size, and general condition. There is enough evidence to show that, if scientifically cultivated, Rhodesian oranges and lemons should have a ready sale at profitable prices in the European market. The orange-grove bids fair to solve the problem of closer settlement in Rhodesia.

Numerous other fruits luxuriate in this land of sunshine.

Sport. Sport enters largely into the life of the Rhodesian

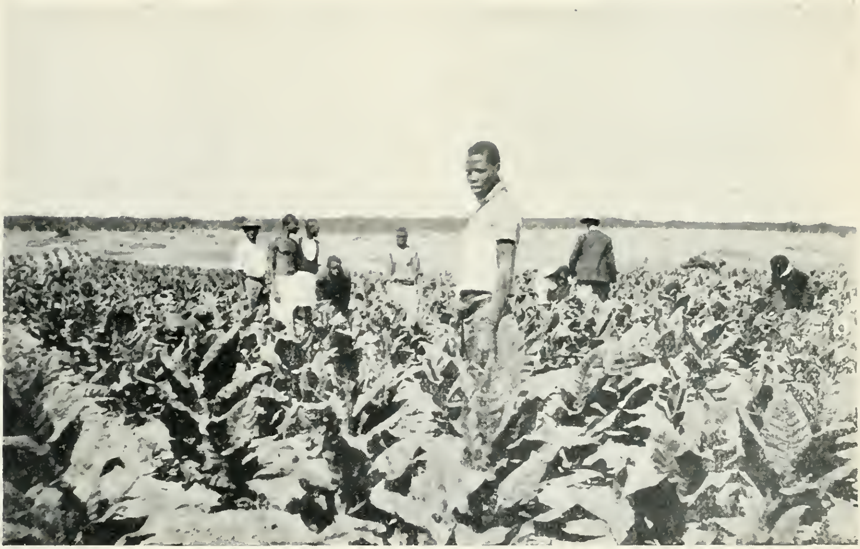

Fig. 3. Rhodesia. Tobacco Field.

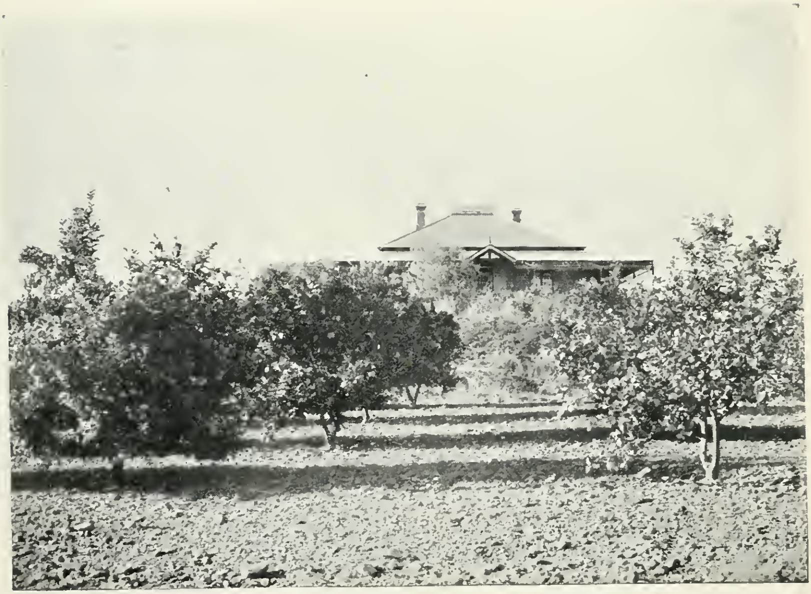

Fig. 4. Rhodesia. Homestead and Orange Grove.

settler. On every farm a shot-gun soon justifies its purchase, as bird life is plentiful and small antelopes still abound. The larger game, followed by the carnivora, are gradually retreating before the rifles of the white man, but swarm in the game reserves, especially upon the rolling plains of Northern Rhodesia. The sport of the wealthy is still the birthright of the Rhodesian of this generation. It would be a sad day if the fiat were to go forth for the wholesale destruction of the magnificent wild mammals, supposing they should be proved to be the cause of keeping alive the tsetse-fly. Science with relentless foot is tracking this noxious insect to its doom. Modern investigations and experience confirm Livingstone's statement that its habitat is absolutely local. Fly can exist on one bank of a river and on the other bank a herd of cattle can roam in safety. For the farmers who occupy districts where the fly is non-existent, this pest has no terrors.

Although within the tropics, Southern Rhodesia, on account of its elevation above the level of the sea, enjoys an equable climate and is never uncomfortably hot; there are several weeks during the year when the weather is bracing, and at night the thermometer registers a slight frost. It might surprise some people to be told that the mean maximum temperature throughout the year averages 76° and the mean minimum 53°.

Now that Rhodesia is accumulating a resident population, the primitive pole and dagga hut is fast disappearing. Houses are substantially constructed on a carefully selected site well exposed to the breezes, and away from water or marshy ground. The space round the dwelling-house should be kept clean and free from trees and rank vegetation. The introduction of the mosquito-proof house and mosquito netting for bedrooms, as well as more settled occupations and better conditions of living, have reduced the European death rate from malaria fever to two per thousand.* From official medical reports it is clear that this rate could be still further reduced if proper care is taken to avoid the mosquito, which only bites at night. Malarial fever in its mild form is no worse than a mild attack of influenza in this country—but it is only common sense to take simple ordinary precautions to avoid even a mild attack.

One of the chief assets of Rhodesia is undoubtedly found in the men and women of Rhodesia, the British colonists who are making Rhodesia their home, and are about as fine types of Briton as can be found in the world nowadays. Women's work of making homes in Rhodesia is waiting for the women of this country, and on the type of women that go out to begin that work depends largely the character of its future population. It is a misconception of our British colonies to suppose that all the men and women most suited to colonial life are to be drawn from the lower classes. Rhodesia is not a dumping ground for the unemployed and unemployable. Nor is there scope in Rhodesia under present circumstances for our labouring classes. Men of capital are wanted to create industries. Rhodesia possesses in the native a labour supply of increasing value, and capital is essential for developing the soil and employing the natives on the land.

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* Here the lecturer paid a well deserved tribute to the researches of the Liverpool School of Tropical Medicine.

Native labour scarcity in Rhodesia becomes periodically acute for reasons well understood by those on the spot, and need not be considered as a permanent disability to the country. The actual number of natives employed throughout the province is larger to-day than it has ever been, and yet the demand remains unsatisfied. It is a satisfaction to know that the Rhodesian native labour ordinances have been adopted *in toto* by the German Colonial Government, having been selected by them as the best pattern of how native labour should be controlled.

The Lecture concluded with views of the Victoria Falls and an appreciation of Rhodes.

* * *

Annual Meeting of the Society, 1912.

The Twenty-seventh Annual Meeting of the Society was held, by kind permission, in the Lord Mayor's Parlour, Town Hall, Manchester, on Thursday, May 9th, 1912, at 3 p.m.

The Right Hon. the Lord Mayor (Mr. S. W. Royse) presided.

The following members and friends attended:—Mrs. Gumbrell, the Misses Lemon, Mrs. Pownall, Messrs. F. Zimmern, F.R.G.S., E. W. Mellor, J.P., F.R.G.S., J. Howard Reed, F.R.G.S., Joel Wainwright, J. P., W. A. Arnold, J. E. Balmer, F.R.G.S., A. Balmforth, —Chapman (Eccles Co-operative Society), J. Herbert Cooke, J. W. Goodwin, J. Howard Hall, — Hodgson, R. Kalisch, F.R.G.S., J. McFarlane, M.A., M.Com., F.R.G.S., F. S. Oppenheim, M.A., W. Robinow, — Rogers, — Safer, Harry Sowerbutts, A.R.C.Sc., T. W. Sowerbutts, F.S.A.A., W. J. Sprott, M.D., and others.

Apologies were read from the President (Mr. Harry Nuttall, M.P., F.R.G.S.), the Rt. Rev. Bishop Welldon, and Mr. S. Oppenheim, J.P.

The Minutes of the Twenty-sixth Annual Meeting, held on May 5th, 1911, were taken as read, a full report being printed in Vol. xxvii. of the Journal, page 53.

The Annual Report and Balance Sheet for 1911 were taken as read (a copy thereof having been handed to each person present).

REPORT OF THE COUNCIL

For the Year ending December 31st, 1911.

The work of the Society has been carried on successfully during the year.

The weekly meetings held during the winter months have been well attended, and the Council desire to express their thanks to all those who have given valuable help. At each meeting the exhibition of the slides has elicited expressions of satisfaction, and enabled the members to appreciate more fully the fine lantern presented by the Vice-Chairman, Mr. E. W. Mellor, J.P., F.R.G.S.

The important and comprehensive character of the lectures delivered will be seen from the following list: —

"Some Geographical Problems of the Mid-Pennines." Dr. A. Wilmore, F.G.S.
"A Tramp through the Wilds of Connemara." Mr. F. Stevenson.
"A Zigzag Tour through Europe." Mr. W. J. Pearce.
"Brittany." Miss L. Edna Walter, H.M.I., B.Sc.
"Through Switzerland to the Italian Lakes." Mr. W. H. Ward.
"Constantinople, Old and New." Rev. Cowley Clarke.
"My Recent Excavations in Greece." Prof. R. M. Burrows, D.Litt.
"The Dolomites." Miss M. C. Geldart.
"A Tour through the Bavarian Highlands." Mr. S. Ashworth.
"A Tour through the Tyrol, &c." Mr. S. Ashworth.
"Andalusia, the Land of the Moors." Mr. C. H. Bellamy, F.R.G.S.
"A Visit to Tangiers and Spain." Mr. G. F. Armitage, J.P.
"The Systematic Study of a Great Earthquake," Prof. Sir T. H. Holland, K.C.I.E., &c.
"Winter Tours in Japan." Mr. Richard Kalisch, F.R.G.S.
"A Botanic Visit to Algeria and the Algerian Sahara." Dr. C. E. Moss, F.R.G.S.
"Travels in Africa's Wonderland." Mr. Broome P. Smith, F.R.G.S.
"Ancient Egypt." Mr. E. W. Mellor, J.P., F.R.G.S.
"The Probable Solution to the Riddle of the Sphinx." Mr. F. F. Ogilvie.
"A New Highway through Canada." Mrs. Louise Hirsch.
"British Columbia." Miss Agnes D. Cameron.
"Niagara Falls." Mr. J. McFarlane, M.A., M.Com., F.R.G.S.
"The Yarrangobilly Caves, N.S.W." Mr. F. Lambert, F.R.G.S.
"The Voyage of the 'Pourquoi Pas?'" Dr. J. B. Charcot, F.R.G.S.
"Captain James Cook, R.N., F.R.S." Mr. C. F. Pughe, M.A.

Four of these addresses were, for special reasons, given in the Association Hall, the others being delivered in our own Hall.

The lecture given in the Association Hall on October 3rd by the celebrated French Antarctic Explorer, Dr. J. B. Charcot, marked a great event in the history of the Society. Those who were present expressed their delight and satisfaction with the account given by Dr. Charcot of his remarkable experiences, and also with the realistic lantern illustrations and cinematograph views shown.

The lack of support given by the members on this occasion caused much disappointment to the Council and some loss to the Society. The Council will feel it their duty, however, notwithstanding this experience, to continue the policy of inviting the great explorers of the day to visit Manchester and trust for better support in future.

Two other lectures in October were given in the Association Hall, those of Mr. E. W. Mellor, J.P., F.R.G.S., and of Mr. F. F. Ogilvie, and the large audience at each lecture fully appreciated the able addresses delivered and the fine lantern illustrations which accompanied both lectures.

The Council thank the Vice-Chairman, for placing his powerful lantern at their disposal on the three occasions referred to. His kindness and skill are highly appreciated.

In December, in response to an appeal on behalf of Captain Scott, further financial aid was given to the British Antarctic Expedition. Advantage was taken of the fact that a series of animated pictures illustrating the start and the first experiences of the Expedition was to be shown at the opening of a new Electric Theatre in Manchester by the Provincial Cinematograph Theatres, Ltd., and, in consideration of their promise to devote the whole of the first two days' receipts to the Scott Fund, the Rt. Hon. the Lord Mayor of Manchester (Mr. S. W. Royse) and His Worship the Mayor of Salford (Mr. H. Linsley) opened the new theatre, and Mrs. Scott came specially from London to attend the function. The result of these efforts, supplemented by appeals by the President and the Chairman, resulted in a sum of about £330 being added to the "Scott Town Hall Fund," which the Lord Mayor kindly re-opened for the purpose.

The Journal for the whole of 1910 has been issued during the year, and in consequence of the large number of illustrations and the extra number of pages, the cost has exceeded the amount usually set apart for this purpose.

Valuable additions to the Library and Map-room have been made during the year, full particulars of which will appear in the Journal.

The Victorians have continued to popularise Geography by lecturing for members and for affiliated Societies. Further additions to the lecturing strength of the Victorians would be welcome. Their ranks have been thinned by the losses sustained during the last few years. The Victorians have also again arranged several social gatherings, which made for the enjoyment of the members who took part in them.

The Council again desire to thank the member who defrays the expense of the special prize awarded on the result of the Examination in Geography at the Manchester University.

The Council deplore the loss by death of the following members:—

Mr. W. H. Buckley, J.P.
Mrs. G. T. Bowes.
Sir W. J. Crossley, Bart.
Alderman R. Gibson, J.P.
Mr. Holt S. Hallett, M.I.C.E., F.R.G.S.
Mr. Charles Roeder.
Mr. F. Smallman, F.R.G.S.
Mr. A. C. C. Somers, LL.D.
Mr. W. Young Martin, M.D.

The Balance Sheet for the Year with the Report of the Honorary Auditor is annexed.

It will be seen that there is a loss of £80 on the Revenue Account due to the extra expense of the Journal already mentioned, the cost of the special lectures, the reduced number of lettings of the Hall, and a decrease in the membership.

The effect of this deficiency on the General Funds of the Society has been diminished by the generous gift by Mr. A. A. G. Tulloch of his five shares (£50) in the Building Company, for which the Council desire to express appreciative thanks.

If the Society is to be enabled to continue the high character of the work accomplished in the past, the experience of the year under review makes it clear that special efforts are necessary to extend the membership of the Society. The Council strongly appeal to the members to do their utmost to attain this object.

REVENUE ACCOUNT.

YEAR ENDING DECEMBER 31st, 1911.

Dr.

1910. £ s. d.		£ s. d.
108 2 0	To Expenses of Meetings	120 2 10
86 1 3	,, Journal, less sales and advertisements	141 15 10
140 9 9	,, Rent, Lighting and Insurance	158 5 5
110 10 0	,, Salaries	110 10 0
108 6 7	,, Wages and Sundry Expenses	114 19 8
10 18 2	,, Commission and Expenses, New Members, and Collection of Subscriptions	6 18 3
4 13 3	,, Books, Maps, Binding, &c., Library	6 10 7
11 2 0	,, Repairs to Furniture	2 2 8
		£661 5 3

Cr.

1910. £ s. d.		£ s. d.	£ s. d.
	By Members' Subscriptions :—		
31 10 0	Life (Transferred to Reserve Account	10 10 0	
511 7 0	Ordinary	505 1 0	
51 19 6	Associate	43 6 3	
14 14 0	Societies	12 12 0	
			560 19 3
2 12 0	,, Victorians		5 15 0
11 1 3	,, Dividend on Shares in Bldg. Co.		12 4 10
1 5 0	,, Interest on Loan to Bldg. Co.		—
2 12 8	,, Bank Interest		1 12 7
1 1 0	,, Donations		—
	,, Deficiency, carried to Balance Sheet		80 13 7
			£661 5 3

BALANCE SHEET, DECEMBER 31st, 1911.

LIABILITIES.				£	s.	d.
To Sundry Creditors				110	10	4
,, Subscriptions paid in Advance				34	13	0
,, Life Membership Reserve Account				105	0	0
,, Kirkpatrick Endowment Fund				50	0	0
,, Balance at December 31, 1910	146	10	7			
Less deficiency for 1911	80	13	7			
	65	17	0			
Add Shares presented by Mr. A. A. G. Tulloch	50	0	0			
				115	17	0
				£416	0	4

ASSETS.				£	s.	d
By 52 Shares of £10 each fully paid in the M.G.S. Bldg. Co., Ltd., as under :—						
27 shares purchased	103	7	6			
25 shares presented	250	0	0			
				353	7	6
,, Subscriptions in arrear				19	8	6
,, Cash in Bank	37	5	11			
,, Cash in Hand	5	18	5			
				43	4	4
				£416	0	4

NOTE.—The Furniture, Fittings, Books, Maps, &c., Lanterns, Slides and Stock of Journals, which are insured for £1,000, are not included as Assets in the above Statement. There are 46 Life Members (of whom two are Honorary), and the subscriptions of 34 of this number have been taken as revenue in years prior to 1908.

I have audited the above Balance Sheet and certify the same to be correct. I have inspected the Certificates for the Shares in the Building Company.

THEODORE GREGORY (F.C.A),
Honorary Auditor.

April 18th, 1912.

The Right Hon. the Lord Mayor, in moving the adoption of the Report and Balance Sheet, said that Geography was of the greatest value to Manchester men. The City's trade extended to almost every known part of the world, civilised and uncivilised, and it was essential that commercial men should attend the lectures of the Society to qualify themselves to know what was going on in distant parts. So that the Society was one which ought to appeal especially to the interest and support of Manchester, and he was sorry that more of the commercial men of the city did not join.

Mr. F. Zimmern, F.R.G.S., Chairman of the Council, in seconding the resolution, said that the Society, which was now in its twenty-eighth year, continued its earnest endeavours to spread a knowledge of Geography, in which people were still very deficient. In a commercial centre like Manchester a knowledge of geography was not a luxury but a necessity, and if the Society was to do in the future what it had been striving to do in the past, it must have more members, especially in view of the fact that the loss by death and resignation had reduced the membership by 25 in each of the last two years. A glance at the list of lectures given during the year, at the names of the lecturers, many of them eminent travellers, scientific men, and great explorers, and at the Journal, issued by the Society at considerable expense, would show that the subscription of one guinea a year, which admitted a member and friend to the lectures, was not a heavy one. And even if members could not attend the lectures, the Society was still of great use to them. It was worth supporting, if only for the reputation of Manchester as a centre of scientific research. The opinion was frequently expressed that the world was now all discovered, and that there was nothing left for a Geographical Society to work for. Quite apart from physical, economic and commercial geography this was a mistaken view. Europe excepted, there were still enormous tracts of country which had never been visited by white men, and there was much scope for this and future generations. Not an unimportant part of the Society's work was to continue its endeavour, hitherto very encouraging, to get the educational system to recognise the importance of the teaching of geography. In referring to the discovery of the South Pole, while not wishing to detract anything from the merits of Captain Amundsen's achievement, he could not deny that they would have been glad if their fellow countryman, Captain Scott, had been the first in the field.

The resolution that " the Annual Report and Balance Sheet be adopted " was passed unanimously.

Dr. W. J. Sprott moved " that the best thanks of the meeting be given to the Officers and Council for their services during the year," and Mr. J. Herbert Cooke seconded the resolution which was passed unanimously.

The retiring Officers and Council, with the addition of the Rt. Hon. Lord Egerton of Tatton to the Vice-Presidents and Mr. Richard Kalisch, F.R.G.S., to the Council, having been nominated: Mr. A. Balmforth moved, Mr. W. Robinow seconded, and it was unanimously resolved that " the Officers and Council as nominated be elected." (See list with Title Page.)

Mr. E. W. Mellor, J.P., F.R.G.S., moved the following resolution :—" That the best thanks of the Society be given to Mr. Theodore Gregory, J.P., F.C.A., for his services as Honorary Auditor, and that he be re-elected."

Mr. F. S. Oppenheim, M.A., seconded the resolution, which was passed unanimously.

It was moved by Mr. J. Howard Reed, F.R.G.S., seconded by Mr. Joel Wainwright, J.P., and resolved :—" That the best thanks of this Meeting be tendered to the Lord Mayor for the use of his Parlour, and for his kindness in presiding over the Meeting."

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Proceedings of the Society.*

JANUARY 1st TO JUNE 30th, 1912.

The 896th Meeting of the Society was held on Saturday, January 6th, 1912, in the form of a Fancy Dress Dance for the children of the members. The wives of the Hon. Secretary and Hon. Treasurer of the Victorians received the guests on arrival at 6-30 p.m. Almost all the children were dressed to represent various nationalities of the world. The Hall had been tastefully decorated by Mrs. Harry Sowerbutts, aided by Mrs. Newlove, Mrs. C. A. Clarke, and Miss F. Bentley. Mr. J. Stephenson Reid made a very efficient M.C., and from 7 p.m. to 8 p.m. the dancing was in progress and the variety and colours of the dresses made the sight a pretty one. The pianists were the Misses I. and E. Newlove and Miss F. Bentley, having the help of Miss D. Newlove as violinist.

At 8 p.m. a lantern exhibition mainly of amusing slides was given by the Hon. Lanternist of the Society.

Refreshments were then served in the Members' Room. Dancing was resumed at 9 p.m. and a very enjoyable evening concluded at 10 p.m. with the singing of Auld Lang Syne.

The 897th Meeting of the Society was held on Tuesday, January 9th, 1912, at 7-30 p.m. In the Chair, Sir Alfred Hopkinson, K.C., Vice-Chancellor of Manchester University.

The Minutes of the Meetings held on December 12th and 19th, 1911, and January 6th, 1912, were taken as read.

The death of Mr. H. Stadelbauer, a member of the Society, was referred to by the Chairman, who reported that the Council had directed a letter of sympathy to be sent to his relatives.

The election of the following members was announced :—Ordinary : Messrs. F. C. Gibbons, Thomas Harrap, and John J. Sidebotham; Associate : Miss A. Daves and Mr. J. F. Sidebotham.

Mr. Robert W. Williamson gave a lecture on "The Mafulu Mountain People of British New Guinea." The address was illustrated with original lantern views. (See page 1.) Mr. W. H. Zimmern moved, and Mr. C. A. Clarke seconded a resolution thanking the lecturer for his intensely interesting account, so well illustrated, of this little known people. The resolution was passed unanimously.

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* The Meetings are held in the Geographical Hall, unless otherwise stated.

The 898th Meeting of the Society was held on Tuesday, January 16th, 1912, at 7-30 p.m. In the Chair, Mr. J. Howard Hall.

The Minutes of the Meeting held on January 9th were taken as read.

Miss Kate Qualtrough read a paper on "The Pathways of the Past," being some impressions of the chief places of interest, historically and commercially, on the shores of the Mediterranean Sea. (See page 4.) The address was illustrated with a large number of lantern views.

On the motion of the Chairman, a hearty vote of thanks was passed to Miss Qualtrough for her interesting and instructive paper and for the views with which it was illustrated.

The 899th Meeting of the Society was held on Tuesday, January 23rd, 1912, at 7-30 p.m. In the Chair, Mr. D. A. Little.

The Minutes of the Meeting held on January 16th were taken as read.

The death of Mr. S. T. Woodhouse was mentioned by the Chairman, and a resolution of sympathy with his relatives was passed.

The election of Miss S. Kate Peters, Messrs. A. W. Wood and Thomas Willcock as Ordinary Members was announced.

The Rev. Austin S. Rogers, F.R.G.S., gave a lecture on "Life amongst the Hottentots and Bushmen."

> Synopsis :—The Land of the Shadow—The Great Karroo—A Shifting Town—"Cape Copper" and Commerce—Train pushing—Sardine diet—A Park in the Desert—Native Superstitions—Methods of travel—"Nature Red"—The Hunter's Paradise—Language deficiences—Home in the Wilderness—Hottentot and Bushmen Ideals—Hands across the Sea.

The address was illustrated with slides from photographs taken during the lecturer's six years' residence in South Africa.

On the motion of the Chairman a hearty vote of thanks was accorded to the lecturer for his interesting account of life in that part of South Africa and for the lantern views with which his remarks were so well illustrated.

The 900th Meeting of the Society was held on Tuesday, January 30th, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S., Chairman of the Council.

The Minutes of the Meeting held on January 23rd were taken as read.

The Chairman referred with regret to the deaths of two members; Mr. George Pearson, member of the Council, and member of the Society for almost 20 years, and Mr. John R. Smith, member of the Society for 21 years and a Victorian Lecturer. It was resolved that the sympathy of the meeting be conveyed to the relatives of each deceased member.

The Chairman announced that Mr. Isaac Chorlton had presented about 20 books to the Society.

Dr. Eric Marshall, F.R.G.S., gave a lecture on "Among the Pigmies and Unknown Races of Dutch New Guinea," describing the experiences of and the results obtained by the joint expedition of the Ornithologists' Union and the Royal Geographical Society. The address was fully illustrated with good lantern views.

On the motion of Mr. J. Howard Reed, F.R.G.S., seconded by the Chairman, it was unanimously resolved that the sincere thanks of the meeting be tendered to Dr. Marshall for his very interesting account of the expedition to this almost unknown country and for the views shown.

The 901st Meeting of the Society was held on Tuesday, February 6th, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meeting held on January 30th were taken as read.

The election of the following members was announced:—Ordinary: Mr. J. H. Greenhow, Norwegian Consul; Associate: Miss C. E. Clegg.

The Chairman brought to the notice of the members the presentation to the Society by Mr. W. H. Ward of a valuable and comprehensive collection of volumes relating to the Arctic Regions.

Regret was expressed at the illness from ptomaine poison of Mr. T. Sheppard, F.R.G.S., whose lecture had consequently been postponed until the Autumn.

Mr. T. A. Edwards, F.R.G.S., who had consented to take Mr. Sheppard's place at short notice, gave a lecture on

"SOUTH AFRICA REVISITED."

The lecturer said:—

When I had the pleasure of addressing the members of this Society on the incidents of my first African trip, I referred to the fact that Africa had been a source of trouble and anxiety to the British Government for many years past, but ventured at that time to state that the old wounds were rapidly healing and even to prophesy, that in the near future the thought of our great Colonies in the dark Continent would fill us with pride and thankfulness, and would no longer leave any room for misgivings or doubts as to their future loyalty and prosperity.

At the time that self Government was conferred on the Colonies, although most people admired the boldness which dared to trust our erstwhile enemies so completely, and to give them such tangible evidence of that trust; many of us thought that it was but a dangerous experiment, and although we agreed that self Government would have to be the eventual solution of the problem, we were inclined to think it had been conferred at too early a date. But,—the bold policy appears to have been fully justified by results; trust has given birth to loyalty, friendly advances have been met by an equally friendly response and our enemies of a few short years ago are now our sworn allies, and even more, our loyal fellow subjects.

The "Boer" in the old sense of the word no longer exists, he exists to-day only as the English, the Scotch, or the Irish settler exists, as a unit of the British Empire, as a splendid factor in New South Africa, who will do all he possibly can in conjunction with what he used to call the "uitlander," now an outsider no longer, to help forward the development and prosperity of the newly federated states.

In the interval between my first and second visits, the progress made towards the blending of the races was perfectly astounding to me. Even the much discussed language question will in the course of a few more years cause no more trouble than does the language question in Wales at the present time.

The Dutch speaking people seem quite proud of their English, and the rising generation will not neglect to learn, what is rapidly becoming the commercial language of the greater part of Africa.

I was taking part in the general conversation in a public smoke room in German East Africa, and during the evening something caused one of my compatriots to say, "We must sing slow here, there are only three Britishers in the room," whereupon a gentleman got up from one of the other groups, crossed over to us and said, "Excuse me gentlemen, I am also a Britisher, and am proud to be one, although at one time I fought against you." It is quite true he could speak German better than he could pronounce English, but instances like that help to make up the British Empire, and make a man proud to be a unit in its composition.

In the introduction to the last issue of *United South Africa's Christmas Annual,* we read :——

> The doubts which lingered even after the four colonies had been thrown into one great Dominion have died away, the smoothness with which a notable change was introduced, and the admirable spirit displayed by the two white races, only a decade ago still engaged in a fierce struggle, has inspired confidence through the British Empire.

The task I have taken upon myself to-night is, to give you as far as possible an idea of the progress which has been made in all departments of life in our African Colony during the short space of a little over two years which separated my two visits. I propose to do this not by any great array of facts and figures, with these I am not prepared—nor yet by learned arguments or brilliant rhetoric, of this I am not capable, but simply by exhibiting on the screen in rapid succession, pictures taken by myself, showing in many instances, what it was two years ago and what it is now. The features I shall try to emphasize are :—

1. The improvements in the means of communication and facilities for travel.
2. The spread of agriculture and the immense improvement in the food supply, and
3. Last, but by no means least, the provision which is rapidly being made for the education, on modern lines, of the rising generation.

I think you will agree with me that any state which can show real advancement on these lines is sure not only of National progress but of the personal well-being of all its citizens. So much has been said and so much has been written, during recent years on this vast subject, that one feels diffident in trying to add one's quota to all that has been put forward with so much authority. My excuse for so doing is, that I have recently been on the spot to see for myself and have probably seen more of our Colonies in South and East Africa than is seen by the average visitor, but my main reason for venturing to put my views before you is, that my hobby of photography enables me to appeal to you far more eloquently than I could by any word picture, no matter how skilfully drawn it might be.

After showing a few introductory pictures illustrating the departure from Southampton, the voyage out and the arrival at Cape Town, the lecturer proceeded :—

Everyone has a more or less vague idea that South Africa is a vast territory, but few people at home really realise how vast it is.

Allow me to call your attention for a few moments to the map, in the bottom left-hand corner drawn to the same scale as the large map, is a map of England. This could be tucked away comfortably in a corner of Cape Colony and would not disarrange it very much, or it might easily be chopped up into pieces and scattered about Africa's great lakes in the form of islands without interfering materially with their navigation. Vast as Africa is, it is made even vaster, by what (for want of a better name) I call "time distance," for example, take the journey from Capt Town to Victoria Falls, they run cheap trips there and back now for about £30, you spend eight days in the train, three days at the Falls, then probably on your return you pose as an expert on Rhodesia. The distance is 1640 miles. If we had a railway long enough in this country, it would not be difficult to do that in about 30 hours, but it takes 96 hours out there, an average of 17 miles an hour, which is good going for South Africa. The fastest train in the African Colonies to-day is, the new Johannesburg "flier" which leaves Cape Town every Thursday morning at 9 a.m. and climbing to an altitude of 6000 feet from the sea level, does the distance of 1011 miles at an average speed of 28 miles an hour, steaming into Park Station, Johannesburg, at 9-15 every Friday night.

When I was in South Africa in 1908 this trip occupied 48 hours. These two examples are only specimens of what may be done all over the African railways in the course of time. Now they are all under one control, rapid strides are being made and they certainly have plenty of scope for improvement. The average speed to-day all over the African railways, with the two splendid exceptions named, is about 12 miles per hour.

Take as an example from Oudtshoorn, the great ostrich farming district, to Port Elizabeth, a distance of 277 miles, which occupies 23 hours; a lot of the delay on this length of line is caused by the fact that a doctor travels by the train and keeps the train waiting while he interviews a patient, dispenses medicine or takes his patient down to the booking office to extract a tooth or two; or it may be he even dashes off on a waiting horse, through the bush and out of sight, to see someone who cannot come down to the train; this of course takes time and is made necessary by the fact, that the train goes through a very sparsely populated district where the conveniences of civilisation are few and far between. As an example of this, we have Uniondale Road, which is the station for Uniondale, notwithstanding the fact that Uniondale itself is 30 miles from the railway.

It is only about 220 miles from Cape Town to Mossel Bay, but the train leaving Cape Town at 8 p.m. only arrives at its destination at nightfall on the following day. Anyone travelling on this line will not wonder at the length of time taken, they will rather wonder the train gets there at all. Like many of the South African railways it was made by contract at a fixed price per mile, the longer the line the more the contractor received, the less money he spent in making tunnels or embankments, the more profit he had; so it was doubly to his advantage to take the line miles round, rather than going to the expense of a little cutting and filling.

This is one of the faults of the early days which the Government have got to remove and they have already saved 12 hours on the Johannesburg line and I have no doubt will save more. The same policy of taking out dangerous curves and gradients will soon make a big difference in the railways all over the Colony.

It is certainly very monotonous doing a big trip at this speed; as from Beira to Bulawayo, on the Beira Mashonaland Railway, which is only 675 miles, but usually takes close on 60 hours to accomplish what might under proper conditions be done inside 24 hours. It was on this line, I once remonstrated with the officials at the length of time it took them to replace a broken coupling. I was surprised when one of them retorted, "It's all right boss, we are allowed 45 minutes for a broken coupling, and we have not been half an hour yet." It was also on this line that the conductor came down the corridor, sat down in my compartment and asked "Which of you chaps can spare a cigarette?" You will gather from this that the conductors are looked upon (or look upon themselves) as being on a higher social level—than the railway guard at home.

The time I fully realised what the African trains were like was on a short run down the South Natal line from Durban to a place called Umzinto, on the outward journey I took my ease in a very comfortable compartment, admiring the scenery en route. The line running mostly in a deep cutting heavily wooded on both sides and parallel with the sea coast. Every now and again it crosses a ramshackle wooden bridge over some river flowing into the sea. On my arrival at Umzinto I was accosted by a man in the hotel, dressed in blue overalls. It turned out, as I was the only passenger, I had had more than my fair share of notice, and this man was the engine driver. After asking me how I had enjoyed the journey, he said, "The only way to thoroughly enjoy it and see the country was to ride on the engine," this of course meant paying an extra fare, which I was quite willing to do for the novelty of the experience, but one such experience is quite enough to last a lifetime. I went back in the manner indicated and it was only then I could thorougly appreciate by the swaying of the train, the way it jumped points, dashed down inclines and swung round curves, what an African railway journey was really like. I may say the special duty entrusted to me was, that of blowing the whistle in order to scare any stray natives or monkeys which happened to get on the permanent way. I saw a great deal more of the latter than the former, as a matter of fact the natives down there stand in great awe of a railway engine, and when we were taking in water at stations they would stand some distance away, clinging to each other in terror, and every time the driver let off steam they would run away screaming into the bush.

After showing some views illustrating the beautiful surroundings of Cape Town and the summit of Table Mountain, the lecturer took his audience on an imaginary trip to Victoria Falls, showing photographs of Mafeking, which he said might be called the half-way house, the Kalahari Desert, where the only kind of vegetation to be found was green melons which grew on the bare sand, sending their suckers down 20 or 30 feet in search of water which they found at that depth.

A number of photographs were exhibited showing the Falls from different points of view, the railway bridge across the gorge, and views of Old Livingstone.

Starting again from Cape Town the lecturer proceeded by the aid of photographs to describe the Coast journey from Cape Town to Durban, giving illustrations of Mossel Bay where he showed photographs of the new schools just completed. A cart journey of 62 miles over the Robertson Pass to Oudtshoorn, then by rail to Port Elizabeth.

As an example of the endurance of the Cape horses, he described how on his first journey he covered 36 miles one day, 50 miles the next day, and 62 miles the next day with one pair of horses, and how at the end of his journey the driver took the horses back 62 miles on the fourth day. In doing the 62 mile length on the second journey he gave plenty of notice to the driver so that change of horses could be arranged for, this was effected by the Dutchman in a typical manner. Having undertaken to change horses half way, this change was made by the expedient of moving the leaders of the luggage cart into the shafts of the passenger cart and taking the horses from the passenger cart and putting them on as leaders of the luggage cart. The Dutchman's idea of changing horses being evidently an exchange only.

After showing views of Port Elizabeth including the Donkin Memorial which commemorates the death of Lady Elizabeth Donkin from whom Port Elizabeth takes its name, the lecturer continued his imaginary journey along the Coast to East London. At this point he showed views of the Port and Town of East London, and also views up-country illustrating the life of Queenstown and Kingwilliamstown. At both these places he was able to illustrate the progress made in the developments of the country by showing views at Queenstown of what was in 1908 a farm, converted on the occasion of the lecturer's second journey into a huge lake containing enough water to last Queenstown during a most severe drought for a period of seven years, and in the Kingwilliamstown district he showed a view of the Pirie Bush taken in 1908 and a further view taken from practically the same spot two years later showing the whole district submerged by the damming up of the Buffalo River, resulting in an inexhaustible supply of water for Kingwilliamstown.

He also showed views of Mount Kemp at the source of the river, which he contrasted with another view at East London where the river enters the sea. From this point he took his audience on to Durban. He showed about thirty views of this up-to-date and go-ahead town, one of the most interesting being a view of the old Town Hall taken three years ago and the new Town Hall recently finished. Also a view typical of the coast, being that of a notice board on the beach, "Beware of Sharks." From Durban, the views illustrated a journey by rail to Johannesburg passing through Pietermaritzburg, Glencoe, Ladysmith, and other places made familiar by the late war.

Views were shown of Talana Hill from which the first shot was fired in the Boer War, and of Majuba Hill. The lecturer said, he had only shown these views as a reminder of what had been; but as an instance of what was taking place to-day, he showed a photograph of one of Kitchener's block-houses which had been converted into a dairy. In this connection the lecturer said, "You all know the old prophecy, which reads, 'They shall beat their swords into plough shares, and their spears into pruning hooks.' This example of one of Kitchener's block-houses, built to defend a railway bridge against the Boers, now turned into a peaceful dairy, speaks eloquently of the progress which is being made in the Colonies on progressive lines."

In Johannesburg the lecturer illustrated the statement "that gold denominates Johannesburg just as cotton denominates Manchester," by showing photographs of Mines and Mining life, including views in the compound, kitchens and sleeping quarters.

Views were also given of Pretoria, showing the great progress which is being made by the building of a new Railway Station, a new Post Office, Women's and Men's Colleges, and a National Museum. The lecturer also informed his audience, that huge sums of money were being spent in changing the horse-car system to electric power, and in laying out and beautifying the town in many directions.

Continuing further North, the lecturer took his audience to Pietersburg and from there by cart about 90 miles North in the low veldt, many miles away from civilisation. Views were shown illustrating the Native life and customs in these parts.

Barberton, one of the oldest gold-fields in the Transvaal, was also illustrated, and from this point the lecturer took his audience a long journey over ground covered by the former photographs to Bulawayo. Amongst the striking photographs of this district were those of Rhodes' grave in the Matopo Hills and Rhodes' monument in the Main Street, Bulawayo. The lecturer said, with regard to this latter picture, that the monument always reminded him of those words of Kipling's which were written in reference to Cape Town :—

> I dream my dream by rock, and heath, and pine,
> Of Empire to the northward, aye, one land,
> From Lion's Head to line.

There was no doubt that sooner or later Rhodesia would become a part of the great Union of the Federated States of South Africa, and when that time came Rhodes' dream would be very nearly consummated.

From this point the journey was continued through Rhodesia touching at Gwelo, Salisbury, Umtali and the districts in the immediate vicinity of these centres.

The lecture was brought to a close by a description of the journey through Portuguese territory from Umtali to Beira on the East Coast.

The lecturer said, in conclusion, I am often told by my friends that they envy me going on these long trips, but you may take it from me in all sincerity that the greatest pleasure to be derived from a journey of this character is, that of talking about it safely seated in an armchair at one's fireside. At the same time there is a great deal to be learned from such a journey and a great amount of interest is aroused in anyone of an observing turn of mind, travelling through the vast Continent in this way. I hope I have not wearied you by the length of my remarks, and trust at all events, the pictures I have shown you will have served to take you in imagination at least

> To the Land of the floods and thunder,
> To her pale dry healing blue,
> To the lift of the Great Cape Comber
> And the smell of the baked Karroo,
> To the growl of the sluicing stamphead
> To the reef and the water gold,
> To the last and largest Empire,
> To the map that is half unrolled.

On the motion of the Chairman a hearty vote of thanks was passed to the lecturer for his interesting address and for the slides shown.

The 902nd Meeting of the Society was held on Tuesday, February 13th, 1912, at 7-30 p.m. In the Chair, Mr. Walter Taylor.

The Minutes of the Meeting held on February 6th were taken as read.

Mr. J. Howard Reed, F.R.G.S., described the "British Association Meeting at Portsmouth." Mr. Reed read his Report as Delegate of the Society to the Meeting of the British Association for the Advancement of Science held at Portsmouth in 1911, and gave a description of some of the chief objects of interest in the town and harbour and in the district, illustrating his remarks with lantern slides. (See vol. xxvii, page 69.)

On the motion of the Chairman a hearty vote of thanks was passed to the lecturer for the interesting account which he had given of the Meeting which he attended on behalf of the Society.

The 903rd Meeting of the Society was held on Tuesday, February 20th, 1912, at 7-30 p.m. In the Chair, Mr. J. Howard Reed, F.R.G.S.

The Minutes of the Meeting held on February 13th were taken as read.

The deaths of two members was mentioned by the Chairman, and it was resolved that the sympathy of the meeting be conveyed to their relatives: Mr. George Galloway, J.P., one of the original members, and Mr. Rudolph Bornmüller.

The Chairman announced the election of Mr. J. N. Dean as an Ordinary Member.

Dr. Tempest Anderson, F.G.S., F.R.G.S., gave an account of "His

Visit to New Zealand," illustrating his address with a large number of fine lantern slides well shown by the Society's good electric lantern.

Mr. Walter S. Ascoli, F.R.G.S., moved, and Mr. Richard Kalisch, F.R.G.S., seconded a resolution, which was passed unanimously, thanking Dr. Anderson for the very interesting account which he had given of his journey and for the illustrations shown.

The 904th Meeting of the Society was held on Tuesday, February 27th, 1912, at 7-30 p.m. In the Chair, Mr. J. Howard Reed, F.R.G.S.

The Minutes of the Meeting held on February 20th were taken as read.

Mr. C. H. Bellamy, F.R.G.S., gave a lecture entitled : "Atlantic to Pacific, across the Canadian Rockies." The address, which was illustrated with many fine lantern views, was an account of a journey across Canada, with visits to the great cities of the East, going by the C.P.R. to Winnipeg, and through the Rockies by the Kicking Horse Pass to Vancouver and Victoria, returning by the Crowsnest Pass, and by the Great Lakes from Port Arthur to Niagara and New York. (See vol. xxvii, page 136.)

Mr. George Ginger moved and Mr. W. T. Blease (who was Mr. Bellamy's travelling companion) seconded a resolution of thanks to Mr. Bellamy for the very interesting account which he had given of the journey and for the fine illustrations. The resolution was carried unanimously.

The 905th Meeting of the Society took the form of a Joint Meeting with the University and was held at the University on Monday, March 4th, 1912, at 8 p.m. The Vice-Chancellor of the University presided.

Mr. Walter McClintock, M.A., gave a lecture entitled : "My Life among the Indians."

> Synopsis : The Blackfeet tribe in former days—Grandeur of their country—My meeting with Siksikakoan, a Blackfoot Scout—Our journey with pack horses across the Rocky Mountains—Flora and Fauna of the mountains—Dense forests and magnificent scenery—The Crown of the Continent—The Old Indian War Trail—A huge grizzly bear enters our mountain camp—Prairie Flowers—The tribal camp of the Blackfeet on the plains—Novel experiences in the Blackfeet camp—Types of men, women and children—Difficulties in securing board and lodging—Marriage customs—Tribal camp on a moonlight night—Singing of War song and Wolf song—Chief Mad Wolf leader of the Sun Dance—His summer camp on the plains—My adoption by Mad Wolf—Mad Wolf's prayer—The giving of my Indian name—Ceremonial of the Beaver Medicine—Legend of the Beavers.

The address was illustrated with original lantern views in colour and with the cinematograph.

Mr. F. Zimmern, F.R.G.S., moved, Mr. J. McFarlane, M.A., M.Com., F.R.G.S., seconded, and it was unanimously resolved that the hearty thanks of the meeting be tendered to Mr. McClintock for the very interesting account which he had given of the Blackfeet Indians and of his life with them, and also for the beautiful coloured slides and cinematograph views shown.

The 906th Meeting of the Society was held on Tuesday, March 12th, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meetings held on February 27th and March 4th were taken as read.

The election of Mr. W. V. Blaikie, as an Ordinary Member, was announced.

A portrait group of the members, prepared in celebration of the 21st Anniversary (1905) and the sittings for which were arranged in 1907, was on exhibition having been kindly presented by Messrs. Lafayette, Ltd., who executed the work.

The Rev. A. L. Cortie, S.J., F.R.A.S., of Stonyhurst College Observatory, gave a lecture entitled: " To the Tonga Islands in pursuit of a Shadow." The address was illustrated with original lantern views, and was a description of the British Government Eclipse Expedition to the Tonga Islands in the Spring of 1911, of which expedition the lecturer was in charge.

Mr. Hermann Woolley, F.R.G.S., moved, and the Chairman seconded a cordial vote of thanks to the lecturer for the very interesting account which he had given of the journey to the Islands, of the life there, and of the observations made in relation to the eclipse. The resolution was passed unanimously.

The 907th Meeting of the Society was held on Tuesday, March 19th, 1912, at 7-30 p.m. Mr. J. Howard Reed, F.R.G.S., presided.

The Minutes of the Meeting held on March 12th were taken as read.

In the absence of the Right Rev. Bishop Welldon, in consequence of family bereavement, Mr. J. Stephenson Reid at short notice, kindly gave a lecture on "Ancient Egypt, with special reference to the Great Pyramid," illustrating his remarks with many beautifully coloured lantern views.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer for his interesting lecture and for the fine slides shown.

The 908th Meeting of the Society was held on Tuesday, March 26th, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meeting held on March 19th were taken as read.

Mr. Richard Kalisch, F.R.G.S., gave a lecture on "China, Past and Present." (See vol. xxvii, page 109.)

Mr. W. Maxwell Reekie moved, Mr. J. Howard Reed, F.R.G.S., seconded, and it was unanimously resolved that the hearty thanks of the meeting be given to Mr. Kalisch for the intensely interesting and instructive address so well illustrated with the large number of fine lantern views.

The 909th Meeting of the Society was held on Tuesday, April 2nd, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meeting held on March 26th were taken as read.

Mr. H. Charles Woods, F.R.G.S., gave a lecture on "Travels in the Ottoman Empire." The address was illustrated with original lantern slides.

Colonel H. T. Crook, J.P., V.D., moved, and the Chairman seconded, that the hearty thanks of the meeting be tendered to Mr. Woods for his very interesting address. The resolution was carried unanimously.

A full report of the lecture is here given:—

MACEDONIA AND ALBANIA.

During the extensive journeys which he made at the end of last year, Mr. Woods said, he found it difficult to ascertain whether the Greeks, the Bulgars, and the Serbs were right in saying that the existing conditions of life are worse than those which prevailed during the reign of Abdul Hamid. It was, however, safe to affirm that of late there had been little if any diminution of the evils complained of under the old *régime*. Even when he was in Turkey in 1909 the Christians were not slow to abuse the new *régime*. But in 1909 they did not assert that the Moslem population was being armed by the Government, that men were being illegally arrested, that Turkish bands were being secretly formed for the purpose of exterminating people believed to be in relation with revolutionaries, and that Christians, marked down for death, were being assassinated by order of the party which governs the Ottoman Empire to-day.

During his recent visit to Macedonia, Christians of all races informed him, and he had reason to think that their information was trustworthy, that the Turkish Government, or perhaps more correctly the predominating clique of the Committee of Union and Progress, was now actually sanctioning or at least conniving at such a state of things.

THE FUTURE OF MACEDONIA.

The future of Macedonia was uncertain. It was impossible to forecast it. The people of each of the neighbouring States possessed some different ideal which was more or less supported by their brothers within the Ottoman Empire. Whilst Servia in her heart of hearts favoured a division of the country between herself, Bulgaria, and Greece, she appeared unable to come to any arrangement with Bulgaria as to the future of certain districts which were in dispute between the Governments of Belgrade and of Sofia. Greece also advocated a division of the country, but on such a basis that the Bulgarians and the Albanians would never consent to it. Bulgaria herself and a large section of the Macedonian Bulgars desired an autonomy for Macedonia which would further the eventual union of that unhappy province with Bulgaria, but a certain number of the Macedonian Bulgars—originally led by the ex-brigand Sandansky—advocated a policy which would secure Macedonia for the Macedonians. The future appeared entirely to depend upon the attitude of the Turks towards the Christians. If the Government endeavoured by more or less liberal and fair administration to regain the support of the population and to carry out at least to some extent the promises made to the people in 1908, then Macedonia might still remain an integral part of the Ottoman Empire. A limited form of decentralised government for Macedonia as a whole or an increase in the powers of the Governors General of the European vilayets of Turkey might yet save the situation. If, however, the Young Turks continued to alienate the sympathy of the non-Turkish races by pursuing their present policy of endeavouring to Turkify all the elements of the population, then the future of Macedonia would largely depend upon the agreement or non-agreement arrived at between certain of the Great Powers who had a distinct territorial interest in Macedonia.

THE ALBANIAN DISCONTENT.

The Albanian subjects of the Sultan, who probably numbered between 1,100,000 and 1,200,000 souls, were divided into two main groups—Tosks and Ghegs. As the Tosks or Southern Albanians were, on the whole, less warlike than their Northern brothers, they had for many years been more amenable to Ottoman control. The larger proportion of the Tosks were Mahometans, but those who were Christians belonged to the Orthodox Church. They were not divided into regular tribes, but had a system of beys or chiefs, to whom they turned for leadership and guidance in all matters of importance. The Ghegs or Northern Albanians, some of whom were Moslems and some Roman Catholics, were made up of a number of warlike tribes, each having a practically separate organisation. The Moslem Albanians were not fanatical, and therefore the question of religion in Albania was of little importance compared with the rôle which it played in other portions of the Ottoman Empire.

At present discontent was rife from North to South Albania. To begin with all the Albanians of the North who refrained from joining in the revolt of last year were discontented because they considered that they ought to be granted the same concessions as those promised by the Turkish Government to the revolted Malissori tribes. The Malissori tribes themselves were dissatisfied because they felt that the promises made by the Government at the conclusion of last year's revolt had not been carried out. In Southern Albania, in addition to the ever-increasing discontent largely caused by the continued efforts of the Government not only to force the Turkish language upon the inhabitants, but to prevent the Albanians from opening schools and learning their own mother-tongue, the painful impression left by the march of Shevket Torgut Pasha at the end of 1910, and by the ignominious treatment to which many Albanians were then subjected, had done much to add to the already existing discontent among the population.

As in the case of Macedonia, the future of Albania was difficult to foretell. Whilst the Albanians were divided in religion, they were united by love of their country. One thing was certain, that as these warlike people advanced in civilisation, and they were advancing every day, they would become more united. Whether or not the majority of the Albanians at present had as part of their programme an autonomous Albania it was difficult to say, but it appeared to the lecturer that the more enlightened leaders were certainly shaping their programme in that direction. As far as Albania was concerned, the problem which would eventually have to be solved was whether that district should be formed into an autonomous province within or without the Turkish Empire. The solution depended upon the attitude of the Young Turks towards the Albanians. If the administration of the Government was improved, and if the Albanians were allowed to develop their own nationality, the most warlike European subjects of the Sultan would also be those upon whom both he and his Ministers could always depend as each new internal or external crisis arose.

SOCIAL CHANGES IN TURKEY.

In the latter part of his lecture Mr. Woods spoke of some of the changes that have taken place in Turkey since the re-establishment of the Constitution in 1908. The fact that the new *régime* brought with it the downfall of a large number of spies was, he said, apparent to the traveller as soon as he entered Turkey. The discomforts of the passage through the Customs House had been greatly reduced. As far as Constantinople was concerned at least two other noticeable changes had been made by the Young Turks. The Western method of telling the hour of the day had been adopted, and the dogs which used to dwell in every street corner had been practically banished. With regard to the position of Turkish women, although he understood that of late a certain conservative reaction had set in among the stricter Mahometans, he thought some minute changes had been effected. He observed on his return to Turkey in 1909 a distinct tendency among the women to go about a little more openly than they had been allowed to do during the final years of absolutism. In Constantinople he had seen Turkish ladies driving with their husbands, and in the provinces he had found husband and wife travelling in the same railway compartment. A larger number of women frequented the streets with the yashmaks raised, and some were, he thought, slightly less careful to arrange their headgear so as entirely to hide the hair from view. It was said that efforts were being made to put a stop to these things, but, on the other hand, in order to fit the women of the future to take a more important position in the country, something was being done to improve the education of a certain number of Turkish girls. Another result of the change in government had been greatly to increase personal security, at any rate of Europeans travelling in Turkey.—*Manchester Guardian.*

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THE WHITE NILE, FROM UGANDA TO KHARTOUM.

By E. W. Mellor, J.P., F.R.G.S.

(Addressed to the Society in the Houldsworth Hall, on Tuesday, November 26th, 1912.)

When mention is made of the Nile, the mind intuitively thinks of that marvellous river, which is the very life-blood of Egypt; and with good reason, for take the Nile away, Egypt dies and becomes an arid, sandy desert. Geographical discovery has informed us moderns that the main Nile, the Egyptian Nile, is made by the junction, at Khartoum, of the Blue Nile and the White Nile. Until quite recent times, however, the sources of the Nile were lost in mystery. We learn from a legend inscribed upon the Pyramid of Unas, that the ancient Egyptians of that period believed that the goddess Isis, daughter of the night, sat upon the island of Philæ, weeping for her lord, the lost Osiris, and that her tears formed the River Nile. Even so recently as the seventeenth and eighteenth centuries the Nile was believed to rise in Central Africa, somewhere vaguely called the "Mountains of the Moon." Now, if we may speculatively identify the "Mountains of the Moon" with the Ruwenzori Mountains, between Lake Albert Nyanza and Lake Albert Edward, those bygone geographers were really not so far out. Geologists tell us that in East Central Africa two great depressions or "rifts," commencing in Lake Nyassa, some 600 miles south of the Equator, run in a northerly direction more or less parallel to each other. These "rifts" are due to great convulsions and volcanic upheavals which happened when the earth was young. The eastern rift forms the bed of several large lakes, the most northerly being Lake Rudolph. This rift skirts the Abyssinian highlands, and joins a similar depression now occupied by the Red Sea. The western rift also forms the bed of several lakes, among them Lakes Tanganyika, Albert Edward and Albert Nyanza, whose waters discharge into the White Nile. Geologists are also of opinion that the whole area between the two great rifts once formed a high plateau, and that, owing to volcanic disturbances during the lapse of ages, this plateau gradually subsided into a vast depression or basin many thousands of square miles in extent. This basin received the drainage of the higher surrounding lands, and eventually formed that great sheet of water or inland sea known to us as the Victoria Nyanza.

It was only so recently as fifty years ago—in 1862—that Captain Speke and Captain Grant, in a journey of exploration from the East Coast of Africa, discovered that the Victoria Nyanza is the main source of the White Nile.

In the following year—in March, 1863—Sir Samuel Baker, working up-stream, discovered Lake Albert Nyanza.

It was not until eleven years later—in 1874, that the upper portion of the White Nile was actually mapped out by Lieutenants Watson and Chippendale, under General Gordon.

The White Nile is entirely tropical, leaving the Albert Nyanza about the second parallel of latitude north of the Equator, and receiving the waters of the Blue Nile at Khartoum, upwards of 400 miles south of the line of the Tropic. The temperature is high. I have myself experienced 104 degrees in the shade, and the thermometer has been known, in the summer, to rise to 126 degrees.

The Blue Nile rises in the mountains of Abyssinia, and has a course of roundly a thousand miles. The White Nile flows a length of 2,029 miles from south to north, more than double the length of the Blue Nile. We may therefore fairly regard the White Nile as the main parent of the Nile proper, or Egyptian Nile. But it is the Blue Nile which brings the annual inundation. The summer torrential rains scour the Abyssinian mountain slopes, and fill the bed of the river to overflowing with water heavily charged with deposit. It is this dark-brown flood, spreading a sediment over the face of the land, which does so much to fertilize Egypt. The White Nile is less spasmodic, and its more gentle flow provides water for irrigation. We know how Egypt is storing and taking full benefit of this supply by means of her system of dams and barrages.

Belts of trees line the banks of the river. In the south these belts cover so extensive an area that we may justifiably call them forests. They afford cover for an immense number and variety of wild animals, such as lion, elephant, buffalo, giraffe, hippopotamus, rhinoceros, antelope, and so forth; also for ostrich, marabou, egret, and other beautiful and valuable birds. Perhaps the most valuable tree of these forests is the "sant" or "sunt" tree (Accacia Arabica), valuable for the strength of its wood, its suitability for boat-building, its excellence as a fuel, and for the tanning properties of its bark and seed pod. Another valuable tree of the accacia species is the "hashab," which grows largely in the Kordofan province, and which yields a gum finding a ready market. Date and other African palm trees flourish more in the north than in the south of the White Nile country.

The natives as a rule cultivate only the land adjoining the river, and hitherto have grown only what they themselves require. During the rule of the Mahdi and his predecessors no man could call himself or his property his own, and this feeling lingers. A few more years of British government may plant in the Sudanie confidence in the security of himself, his crops and his herds, and the spirit of commercial enterprise may be engendered in him, but it is patient, uphill work.

For about the first 200 miles of their course the waters of the White Nile wash, on their right bank, the shores of the Uganda Protectorate. With this comparatively small exception the river lies entirely in the Anglo-Egyptian Sudan. When this fact is grasped it will be realized for how vast a tract of Africa the British Government is responsible.

The native tribes along the banks of the White Nile are unclothed heathen savages. The three most numerous tribes are: The Baris, whose country extends from Uganda northwards to Bor; the Dinkas, whose scattered villages extend upwards of 600 miles, chiefly on the right bank of the river; and the third great tribe, the Shilluks, whose villages extend for 700 or 800 miles, chiefly on the left bank of the river.

Durra corn and maize are the principal crops; other crops are beans, lentils, onions, melons and a little barley. Little cotton is as yet grown, though the conditions and the soil are favourable. The cultivation of cotton ought to be encouraged and inducements given to the native, such as gifts of seed, facilities of sale, and so forth.

Owing to sandbanks, submerged rocks and rapids, the White Nile is unnavigable from its outflow from the Albert Nyanza

Lake until it reaches Rejaf, latitude 4 deg. 45 min. north of the Equator. From Rejaf the river is navigable all the way to Khartoum, 1,100 miles; and the Sudan Government sends a light-draught, wood-burning, stern-wheel steamboat these 1,100 miles at fortnightly intervals to maintain postal communication and to carry officers and troops.

Let us follow the White Nile down stream from this point, Rejaf, by means of the Government steamboat. Nineteen miles brings us to Gondokoro, the most northerly British Government station in the Uganda Protectorate. Twenty-five miles further on we pass the most southerly military station in the Sudan, at Mongalla. After passing Bor, another 79 miles on, we enter that remarkable and weird stretch of the river called the "Sudd," full of wild live creatures, all except human beings. Passing Lake No and the junction of the Sobat River, we find ourselves for many days amid Dinkas and Shilluks, clothed only with a spear, the river alive with crocodiles, strange beasts and birds. Six hundred and thirty-one miles from our starting-point carry us down to Kodok, formerly called Fashoda, a place which nearly led to a quarrel between France and ourselves. Another 300 miles down stream and savage Dinkas and Shilluks are left behind. The black Sudani begins to conform to the requirements of civilization. We meet the Arab merchant in his long robes and the Greek traders whom General Gordon dignified by calling them "pioneers of civilization." On the river banks wild beasts have given way to flocks and herds. Omdurman and Khartoum come into sight. What stern, bitter history those names recall!

* * *

The part of the White Nile below Rejaf is known locally as the Bahr-el-Jebel or Gebel, a name which signifies "the River of the Mountains." The Rejaf mountain rises 374 ft.* into the air, and is an almost perfect cone. The whole formation is volcanic, indeed Sir Wm. Garstin says that this mountain was itself once a volcano and that the rocky mass at the summit, resembling a ruined castle, was the crater. Here, so near the Equator, the ascent of this mountain is a hot and tiring climb, only to be undertaken in the early morning or late afternoon when the sun is not at its full power. Between the mountain and the river the regular lines of the native straw huts are situated; while to the right are the dwellings of the Europeans and officials. This place, Rejaf, 1,100 miles south of Khartoum, so remote from civilization, has experienced some remarkable vicissitudes during the last 25 years. After the fall of Khartoum and the death of Gordon at the hands of the Khalifa in 1885, the victorious dervishes spread themselves over the whole Sudan, and occupied Rejaf in 1888. The Khalifa used the place only as a penal settlement and as an outpost against white people.

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* This height is above the level of the River, which is 1499 feet above sea-level.

The Belgians, who were in the Congo Valley, were anxious to have some stations on the Upper Nile, for trading and military purposes. Accordingly, under a treaty of May, 1894, some of these positions were leased to King Leopold for his lifetime. In 1897 the Belgian General Chartin marched his Congolese forces upon Rejaf, routed the Dervishes, and proceeded to occupy the leased land. After King Leopold's death, Rejaf and other Belgian settlements reverted back to the Sudan, according to treaty. It is usual, in our own stations, to spread out the dwelling-houses; the Belgians, on the other hand, made a small clearing and built all the residences close together, some of them are roofed with corrugated iron, and others are neatly thatched with straw. They are, however, too close together for comfort in this hot climate, where there is so much sun and dust and so little shade from foliage. At the Rejaf Post Office may be seen the notice board of mails, etc., hanging under the deep eave made by the thatch, which also serves as a verandah. There are no European ladies here nor at any of these savage stations. The Government does not allow them to reside at places remote from civilization, that is, south of Khartoum. A married official, therefore, when on duty up country, must leave his wife at Khartoum.

The rough wooden posts which form the walls of the Rejaf Post Office look insecure, but they are quite suitable, because Rejaf is very subject to earthquakes; indeed, the name Rejaf, so Sir Wm. Garstin reminds us, signifies earthquakes. Just below Rejaf we have another evidence of volcanic action or upheaval, in a wall of rock placed right across the river, leaving only a narrow opening just wide enough to allow the stern-wheel steamer to pass through. The White Nile comes rushing between the rocks at, I suppose, thirty miles an hour or more.

It was an exciting moment getting the steamer through. The Reis, or native pilot, turned the steamer round, and went through the rapids stern foremost, keeping head on to the rushing water. Since my return home I have heard of one of the Government steamboats coming to grief in these rapids.

On the right or east bank of the river, as we proceed northwards, we pass many small scattered villages of the Bari tribe. Their huts are almost entirely of thatch, and suggest large bee-hives. These people live largely on river fish, and they grow a little durra corn, ground nuts, with perhaps a little tobacco.

Following the stream northwards for 19 miles, we arrive at Gondokoro, on the east bank of the river, and the north frontier post of the Uganda Protectorate. General Gordon was appointed Governor-General of the Equatorial Provinces of the Nile in 1874, his headquarters to be this place, Gondokoro. He arrived here on April 15th of that year, and promptly took measures to suppress the slave trade, of which Gondokoro was an important centre. The river current has, Sir Wm. Garstin says, made a severe set on the bank here, causing it to crumble down and fall in. Much has already gone. An Austrian mission, which formerly stood on the river bank, is gone; and if this action continues for a few more years some lebbek trees and dom-palms, which we saw, will also fall in.

At Gondokoro we are in Uganda; the White Nile stretches away to the north. The other side of the river is the Sudan with its capital city, Khartoum, far away, more than 1,000 miles down the river.

At the Post Office at Gondokoro, which is quite an imposing establishment, we bought Uganda postage stamps. The postmaster seemed to be quite as much at home with big game, skins, heads, horns, etc., as he was with postal information.

In these higher reaches of the river the natives use a long narrow canoe hollowed out of the trunk of a single tree. The canoes are scarcely of sufficient width to allow a man to sit down, so he may be said to sit on both sides at once. Although unsinkable, these dug-out canoes easily roll over and the occupants are thrown out. This makes the natives very expert in handling the paddle and manipulating the canoe. These narrow dug-outs hold as many as six men, and are used both for transport and for hunting.

In this region we pass, at intervals, great patches of papyrus grass, 15 ft. and upwards in height, and so dense that a man is promptly lost to sight if he ventures into it. One clump of this papyrus or elephant grass, as it is sometimes called, which I photographed, contained a herd of wild elephants, some eight or ten in number, hidden in its cover. Occasionally a trunk would shoot up in the air to sniff round if danger were near.

Another 25 miles brings us to Mongalla, the most southerly military post of the Sudan Government: latitude 5 deg. 12 min. north, and still 1,056 miles from Khartoum. At Mongalla there are barracks, soldiers and various officials, headed by a Governor, whose official title is, I believe, "Resident Inspector." There is a comparatively large population at Mongalla, and just before we arrived supplies ran short. We received orders from the Governor to call at a certain village and bring a number of sheep to feed the people of Mongalla.

Every now and then some one of the interior tribes raids its neighbour's cattle, steals its corn, or commits some other depredation. Blood is shed, and the Government has to send a military punitive expedition to restore order and peace. Owing to the desert-like nature of so much of the Sudan, food being difficult to obtain, and the supplies of water being days apart, these punitive expeditions are frequently a large and costly business, entailing large transport of stores and provisions. When we paid our second visit to Mongalla one of these expeditions had just returned from up country. The native bearers—transport men who accompanied that expedition—were fine-grown, athletic-looking fellows, untrammelled by any clothing, save for a red turban on their heads, which they were made to wear to show that they are attached to and are servants of the army.

The expedition, having destroyed the village of the turbulent tribe, brought a number of its men back with them as prisoners of war. These men, fearing death or some other severity, quickly took Government service, and are, after training, to be drafted into a Sudanese regiment as soldiers. These hitherto naked savages were clothed in white canvas suits, marched on to a barge attached to our steamer, and chained together by the ankle to prevent escape. They travelled with us for days, more than a thousand miles, until we reached Omdurman, where they were marched to the barracks, the chains having previously been taken off their ankles.

Mongalla, being a Government and a military station, is, comparatively speaking, civilised; but as soon as you leave it you are in the wilds again.

At the village of Gigging we saw a characteristic scene. The construction of the native hut was clearly seen—a circular wall of canes, stout reeds or thin boughs, surmounted by a thatch of durra-straw. It is called a "tukl," and constitutes the home; it contains little more than the "angarib," or native bed. Another hut, set on piles so as to keep it dry in any possible flood, contains the grain store, and is called a "gougou." The people are of the Bari tribe, and live chiefly by fishing. The man is tall, gaunt, muscular, and very thin; he is stark naked, but when he sallies forth from his tukl he will carry a spear. A woman carries her baby on her back in a skin bag, which she can hang on a cross stick so as to form a cradle. These Baris seem to be rather a poor race, physically and mentally; they are lazy and unwilling to do any more work than is necessary to keep them in existence.

A little further on is one of the more picturesque villages, thanks to the lofty trees of the accacia family. In this village, Sheik Tombé, the tukls are in regular order, and the thatch is trimly kept. Here at Sheik Tombé we have come just 100 miles from our starting point, Rejaf, but our goal, Khartoum, is still far off, 1,000 miles away, in the north.

Five miles further on down stream we arrive at the Church Missionary's station at Malek, and a very flourishing station it seems to be. The Rev. Mr. Scanlan is the senior missionary and head of the station. He did not suggest the conventional parson, although it was Sunday afternoon when we were there. You must remember that we are in the wilds of equatorial Africa, and that these good missionaries have to work hard to maintain life at all. One building is a bungalow, the missionaries' home, and contains their dwelling rooms, their stores of books, of medicines, and of surgical appliances, which contribute so largely to the success of their influence over the people. Beyond the house is an enclosed area of ground in which they grow their corn and vegetables, also some experimental crops, such as cotton. They also rear some animals; for instance, we bought a sheep for food from them. Only a few days before we arrived a crocodile came up from the river and carried off one of the children. This is still the country of the Bari tribe, but we are now beginning to meet the Dinkas; in fact in this district there is to be found a cross

[E.W.M., 1912

In the Sudd.

[E.W.M., 1912.

A female Crocodile, White Nile.

between these two tribes, called the "Aliabs." Major Boulnois writes that these tribes "associate the ideas of reverence and divinity with the sky, and of malignity and punishment with the interior of the earth; pointing upwards to their gods and downwards to their devils. This association is, he believes, universal and has probably its origin in sun worship."

Another 18 miles brings us to the village of Bor, a small military post furnished by and subordinate to Mongalla. Sergeant Stead was the solitary English soldier here—a sapper responsible for the telegraph line. An interesting fact is that General Gordon occupied this place in 1874 with a small force which he utilised to put down the slave trade then rife in this part of Africa.

We pass a chain of scattered Dinka villages, and after 67 miles come to the village of Kenissa. The village is inhabited by Dinkas more or less naked. We saw some Dinka women grinding durra corn, which is a kind of millet. A piece of tree trunk is hollowed out and used as a mortar, into which the grain is put, and the pestle is a pole or branch of a tree. This gives a coarse meal, which is then ground finer, between two flat stones, the lower one of which is fixed, and the upper one is worked backwards and forwards. The meal, when mixed with water, is baked into flat cakes, or boiled into a kind of gruel or porridge. It is also fermented into a kind of thick sweet beer called merissa, of which the natives are fond, but probably you would not like it. A Dinka man has, on the average, about six wives, but headmen will have as many more wives as they can afford. The price for a wife varies in different districts, but it is usually 25 to 40 head of cattle. During that dreadful time when the Dervishes over-ran and occupied the country, cattle became very scarce, and the price of a wife was actually reduced as low as one cow.

The Government steamer, as you know, burns wood, and Kenissa is the last wooding station before we enter the sudd. As it takes at least two or three days to traverse the weird sudd region a large quantity of fuel must be taken on board. Kenissa is therefore one of the most important wooding stations on the White Nile.

In the sudd region we wore mosquito boots, which were drawn up over our trousers, to keep mosquitoes from our ankles and from crawling up our legs. In this swampy district the mosquitoes are virulent and voracious, and their bite may give you malarial fever. The river has apparently a channel of from 60 to 100 feet wide, but if you could climb to the top of a high mast, you would see that the real banks of the river are four, eight or even twelve miles distant, and that the channel runs through a vast sea of reeds, papyrus and sword grass, greater than the eye can take in. Such is the sudd—a name derived from an Arabic word signifying "a block." The sudd extends for some 250 to 300 miles. The area is difficult to estimate, but, according to some officers of the Sudan Government, it cannot be much less than 35,000 square miles. These swamps probably represent the bed of an ancient lake, which has, to a certain extent, dried up.

For 150 miles there is no sign of human life, but there are always the crocodile and the hippopotamus, many curious and beautiful birds, strange insects, fairy-like fire-flies and the ever-virulent mosquito. Add to this an odour of decomposing vegetation more or less strong, and you have a hotbed of malaria, which has proved disastrous to many European constitutions. You may be sure that we paid due regard to quinine and our mosquito boots.

The vegetation forming the sudd may be described as of three classes:—First, plants whose roots descend through the water to the river-bed; of these are chiefly papyrus and the common reed, here called "Bus." Second, plants whose roots are in the water, but do not strike down to the ground or bed of the river; the principal grass of this class is called by the Arabs the "Um-sûf" grass, a name which means "Mother of Wool," so called because of the irritant hairs found on its leaf sheaths, and which adhere to the skin of anyone touching them. Third, plants which swim entirely on the surface of the water, and which perform the office of binding the first two classes together. The most common specimens of this class are "Pistia," a small cabbage-like plant with bright green leaves; and "Azolla," resembling moss in texture.

Now, if a rise of water-level occurs, or a sudden storm arises, large masses of this vegetation are set free and drift down stream, their tangled roots carrying large quantities of the earth in which they were embedded. The moment they reach a shallow these roots act as anchors and speedily strike down into the muddy bottom. More of these drifting masses are borne down upon them, quickly blocking the channel with an impassable barrier of sudd. So compact and solid does this sudd-block become that the Government employs powerful steam dredgers to clear the channel. The drifting masses of sudd are a real danger to steamboat navigation. If one of the boats be surrounded by moving sudd the compression would probably strain her framework to the risk of crushing it; in any case she would be imprisoned owing to the channel blocking up all around her, hence the necessity for this costly dredging. In addition to the vegetation, the dredger at times brings to the surface curious creatures and forms of life. I was told that one day they actually dredged up a young hippopotamus.

The papyrus grass, with its feather heads, fifteen or twenty feet high, affords fine cover to much large game.

The White Nile abounds in crocodiles, and I saw many 10 feet and more in length. The natives are glad when a crocodile is shot, for many a woman coming to draw water at the river bank, or her plump little child, or sheep or goats, have been the meal of these greeny-grey loathsome beasts. A crocodile does not devour a child or a sheep at once, but he snatches his prey, quickly drags it under water, drowns it and then takes his meal piece-meal at his leisure.

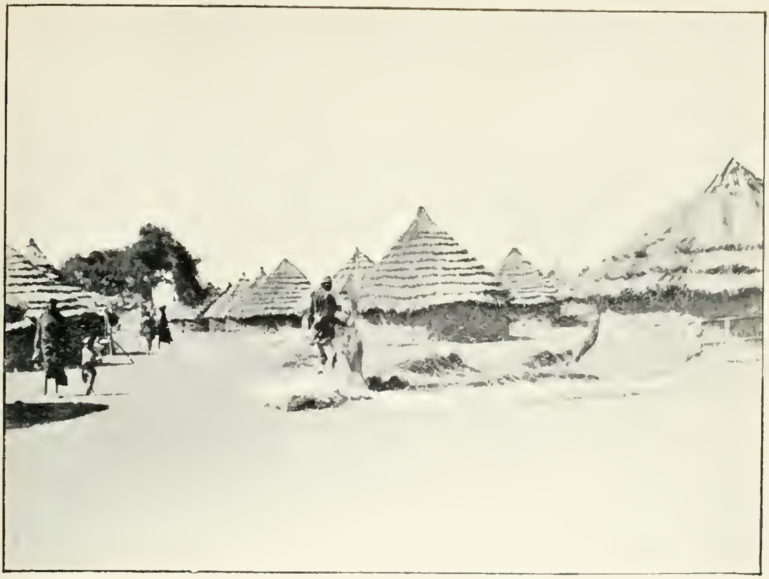
About half-way through the sudd we reach a point at Hillet-el-Nuer, where the ground rises about three feet above the surrounding sudd. We take advantage of this to stop and clean out the fire-box and flues of our wood-burning steamer. While that operation was proceeding I took a colour-photograph of a tall handsome cactus in flower, and behind it dom-palm or mock-ivory palm, called by botanists "Hyphoene crinita." The effect to our eyes after so much swamp and sudd was beautiful and a great relief. But there were neither huts nor human beings to be found here. We did, however, find crocodiles' eggs and snakes' eggs; and while I was taking the photograph one of our party saw a large snake lurking in the foliage.

The natives have a pernicious habit of setting fire to the marsh reeds and papyrus when they want to make a clearing for cattle or when the forest path is overgrown, or to scare wild beasts away. Once commenced these fires, catching the sun-dried foliage, spread very rapidly, and the sudd-swamps are swept through from end to end by fierce flames which carry everything before them and which kill nearly all the trees which attempt to gain a footing, thus causing wasteful loss of timber. We saw one of these great sudd fires at sunset on the 14th of February. The fire itself was some miles away, yet the smoke came rolling over our heads and the crackling of the wood and leaves sounded quite near. The effect of these fires at night is weird and surprising.

Emerging from the sudd and crossing the eastern end of Lake No, the 525th mile from our start lands us at Tonga, on the left bank, and which I may describe as the getting off place for the southern part of that large tract of the Sudan known as Kordofan. Here at Tonga is a flourishing Austrian Roman Catholic mission station. The good Austrian fathers have built a handsome church with their own hands and their own labour. We saw some of the Tonga ladies walking towards the church; the fact is that they work in the large garden of the missionaries for some system of payment or wages. There were also some Tonga children; one was a smiling little maiden, with face and body as of polished ebony, who seemed to be mothering two wee mites, all terribly afraid of the white man, with his mysterious box with an eye in it—my camera! One native was specially noticeable: he was a Tonga gentleman, a great swell and dandy, with all his ornaments and in fashionable array, having an ivory amulet round his left arm. He was of the Shilluk tribe, and carried two spears with blades of differing shape. It is derogatory to his dignity to do any work at all; he will only hunt, and in the pursuit of that he can run like the wind. He was attended by a youthful follower or admirer to fetch and carry and do his bidding.

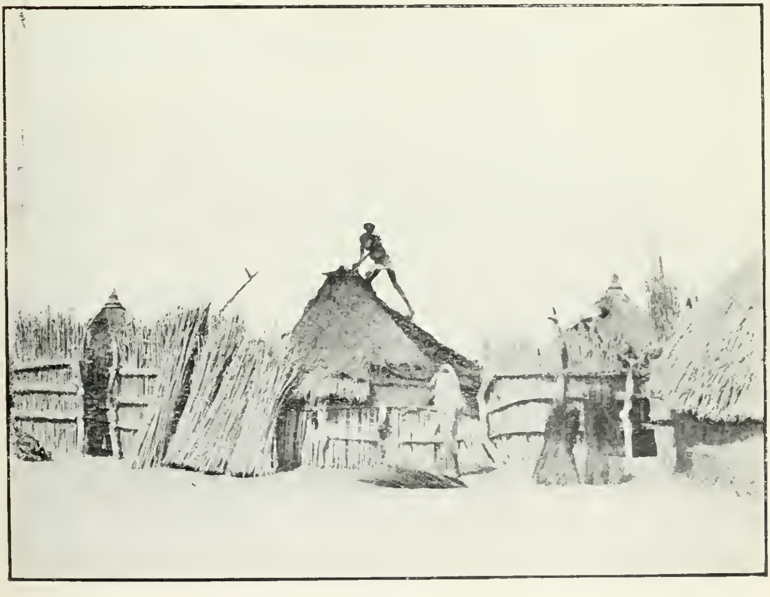
We next came to a characteristic scene near Tonga. Round three sides of a khor or lagoon were some 80 or 100 Shilluk men: one after the other, each man, like an automaton, plunged his spear into the water in the hope of transfixing a fish. It is only occasionally that a fish is speared, yet these tribesmen work away with their spears patiently for hours like so many machines.

Not only is the river full of fish, but the thick vegetation affords cover for game of many kinds: big game—elephants, lion, buffalo, rhinoceros, leopard, and so forth, from which I had personally to keep at a respectful distance. There are also great numbers of herds of various antelopes, which can go like lightning, which provide fine sport in hunting and stalking, and which provide the sporting element of risk, because when at bay, they will turn and face you with very formidable horns. In this class are harte-beest, roan-antelope, tiang, bush-buck, reed-buck, water-buck and many more. They are shy and



[E.W.M., 1912

Village of Taufikia.



Mrs. E.W.M., 1912

Thatching a Tukl at Kodok.

timid and difficult to approach. A dainty and beautiful little animal of this family is the gazelle. Wonderfully fleet of foot, the way they bound over obstacles, even those of great size, is something fairy-like to behold. Here in the Upper Nile Valley are to be found some six or seven different varieties of gazelle. One of the tributaries of the White Nile, which flows in a few miles above Tonga, is named after them, Bahr-el-Ghazal – "Gazelle River." Wild and shy though gazelles are, they seem to have reasoning powers. As we travelled on the railway among the kopjes between Port Sudan and Atbara, some gazelle stood by the line quite still and watched the train pass by. They had undoubtedly observed that railway trains, however noisy, do not wander off the lines into the bush after them. Perhaps the rarest antelope in this part of Africa, and one of which every sportsman is anxious to obtain a specimen, is that known as Mrs. Gray's Water-buck. I witnessed one particular buck stalked for several hours through long grass and reeds, and finally shot by Captain Vaughan, who is on the staff of the Sirdar. The wounded beast galloped some few miles before he fell, and Captain Vaughan returned to our steamboat all grimy and black from having made his way through vegetation, charred, blackened and burnt by one of those forest fires such as we saw. You may always know a Mrs. Gray by his snow-white patch on the shoulders. He is only to be found in the swamps of the Upper White Nile and the Bahr-el-Ghazal. He stands as high as a man, and when at bay his long horns are a terrible weapon.

Thirty miles below Tonga we remained all night at a wooding station named Khor Attar. It was bang, thump, bang, thump, bang, thump, all night as each bundle of faggots was thrown down on to our deck. I managed to sleep through most of it, but in the morning it was found that the wood taken on board had weighted the boat down through the shallow water on to the sandy bottom. So the wood-carriers had to wade out to us to push the boat off into deep water. This they accomplished by leaning their back against the steamer and pushing with their feet against the bottom with all their strength.

A few miles more bring us to the junction of the Sobat River with the White Nile. We have come upwards of 500 miles from the far distance since we started from Rejaf, and we have still 500 miles to travel, so at the junction of this river we are about half-way. The Sobat brings down a light friable soil which gives the water a creamy-white colour. According to Arab nomenclature, the main river now gets the name "Bahr-el-Abiad" or "White River."

Five miles down stream from the confluence of the Sobat is Taufikia. As far back as 1865 Taufikia was Sir Samuel Baker's headquarters, and it is to-day the second station in importance in the Upper Nile Province. A Sudanese battalion has its headquarters here, and on the bank are a number of substantial buildings, stores, and so forth, with corrugated iron roofs. There is a good landing place, and the deleib palms cast a grateful shade from the Afric sun.

Here we make the acquaintance of the trading boats of the Upper Nile. They are called "nuggers," and are an indication that we are beginning to approach the outposts of civilization. Nuggers are strongly built of hard timber, occasionally half-decked, and are fitted with one mast and lateen sail. They are of various sizes, but are built to carry up to 200 ardebs, *i.e.*, about 25 tons. They are mostly employed in carrying grain or gum. These nuggers are not so high in the bows nor as graceful as the gyassas of the Lower Nile, but still have a very picturesque appearance.

The native, for his purposes, uses the ambach canoe. Ambach is a kind of osier or pith-like cane. The canoe is composed of a thick bundle of ambach canes tied together and turned up at the bows. The canoe is exceedingly light, and is easily carried on the shoulder. When a man wants to cross the river or to go up or down stream, he launches his ambach canoe, seats himself upon it and paddles across with his fruit, fish or other produce.

We visited the native village or town of Taufikia, and especially noticed the regular lines of the tukls; the entrances are so low that the people have to go down almost on hands and knees to enter their homes. Most of these tukls are occupied by the families of the native Sudanese soldiers, hence they are called the "Haremmat." The Commanding Officer has adopted the novel policy of appointing two of the senior women, sheiks, *i.e.*, a kind of monitors or prefects, responsible for the good conduct and behaviour of the women and children.

We next arrive at Kodok, the modern or native name for Fashoda, which is in latitude 9° 53′ north. The town of Kodok is up a narrow backwater from the river. Only small craft can get up; the Government steamer cannot; consequently passengers and goods have to come along a causeway almost two miles long, to the landing place. It was the possession of this place which nearly led to fighting between England and France. In 1896, a French force, under Major Marchand, set out from the French Congo, with the view of establishing a French station in the Upper Nile Valley. After experiencing enormous difficulties in the swampy region of the Bahr-el-Ghazal, this gallant French force, with the help of their steam-launch "Faidherbe," reached this place, Fashoda, and planted the French flag here. Six weeks later the French were attacked by a force of Dervishes. Marchand repulsed the Dervishes, and, in straitened circumstances, awaited a second attack. The Egyptian gunboats arrived in time, and probably saved Marchand and his force from annihilation. The English and Egyptian flags were immediately hoisted to the south of the French flag. Kitchener of Khartoum came up and insisted that Fashoda was an integral part of the Anglo-Egyptian Sudan, and that the French must retire. Marchand demurred, Kitchener insisted. This nearly led to strained relationships between France and England. Eventually the French position was found to be untenable, and on the 11th December, 1898, Marchand and his companions evacuated the place.

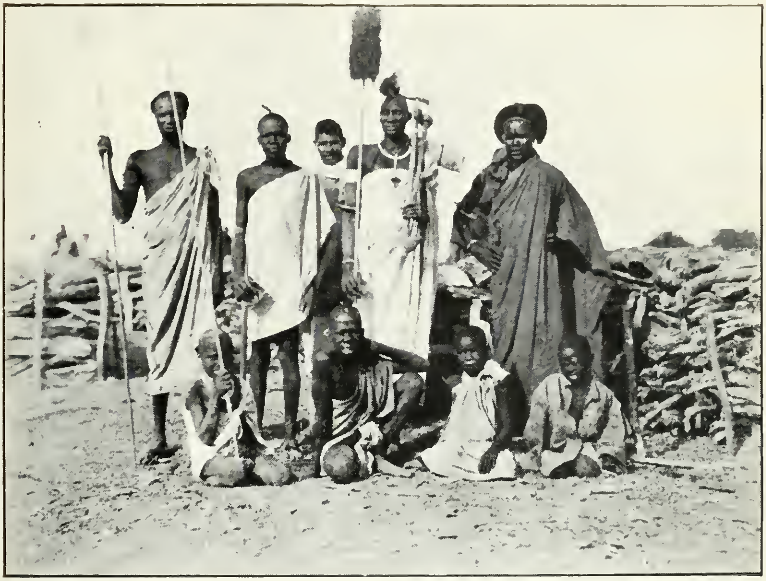
Kodok is in the heart of the Shilluk country, and their king or "mek," as they call him, lives near by. When General Gordon set to work to stop slave trading an Egyptian Governor, with a military force, was established here at Kodok to arrest all illegal traffic. In 1882, the Mahdi, having proclaimed himself the prophet foretold by Mohammed, defeated the Governor of Kodok and destroyed his whole force. Then began a hard time for the poor Shilluks—bondage, oppression, their corn and cattle raided, their maidens carried off for the Mahdi; until, in 1890, the Shilluks rose in rebellion against the Dervishes, and there was much bloodshed.

Since the final defeat of the Dervishes by Lord Kitchener the Shilluks have gained confidence. They are encouraged to become good citizens, and so long as they are law-abiding they are free from molestation. It was interesting to watch a Shilluk man thatching his house or "tukl" at Kodok. He used the cornstalks or straw of durra corn, and made a neat job of it. We also noticed a Shilluk woman, sitting at the door of her tukl and plaiting, with straw, one of those large circular trays or baskets in which they carry corn and all sorts of articles and expose their produce for sale.

Moving another 119 miles down the river, we called at a large wooding-station, Meshra-el-Zarom. While the boat was being wooded an old Dinka chief and his bodyguard came to look at us. He carried a spear point downwards, and had a magnificent plume at the top of the shaft. He had his club or knob-kerry over his left shoulder, and a capacious tobacco-pipe. Through our engineer I held parley with the old chief, and offered him some tobacco. I produced a new ½lb. tin, but the bowl of that huge pipe was so capacious that it seemed like to swallow up all my half-pound, and I had to shout, " Hold, enough." My advice is, never trust a man who wields a two-handed pipe!

Seventy miles further on down the river, at Reuk, I photographed a group of Shilluk warriors. The Shilluks are physically a fine race, averaging quite 5 ft. 10 in. in height. In colour they are a glossy blue-black. They dress their hair rather strangely. The forehead is shaved, and then by a mixture of mud, gum and cowdung, the hair is twisted into extraordinary shapes, such as " tam o'shanter "-like halos, plumes, knobs, etc. Each man carries and cherishes a long spear with a laurel-leaf-shaped blade, and with tufts of ostrich feathers near the butt. When prepared for war he carries also a knob-kerry and an extra throwing spear or two.

Another 170 miles down stream, nearly 1,000 miles from our starting point, and still 180 miles south of Khartoum, we meet organized civilization in the shape of the White Nile railway bridge, which carries the Sudan Government Railway to Kosti, and an extension only opened this year, to El Obeid, the capital of the Kordofan Province. It was then the most southerly bridge in the Sudan, and is a swing bridge, the central spans swinging open to permit the passage of vessels. It is a fine piece of engineering work, and one is surprised to find it or a railway at all in this remote district where white ladies are not yet allowed to live. Its construction speaks volumes for the enterprise of the Government and for their estimate of the potentialities, with good government, of the Sudan. The railway superintendent had a comparatively cool office at the Kosti Railway Station, but his only home was a railway carriage in which he had a bed and a cooking stove. The grey gum, accacia hashab, is the prevailing tree in this



E.W.M., 1912

Dinka Chief and Body-guard at Meshra-el-Zarom Wooding Station.

region, and sacks of gum were piled up on the river bank ready to be shipped on the nuggers for conveyance to the merchants at Omdurman. The gum is a freight calling for much responsibility, for should it get wet the gum begins to dissolve and the cargo gradually melts away.

We are now leaving behind us the negroid tribes and their beehive-shaped huts. We have left the hunter behind, and the country from here northwards is largely populated by Arabs. The river banks assume a pastoral character, and wild beasts have given way to peacefully grazing flocks and herds.

Sixty miles further down stream we come to El-Dueim, an important trading centre. In the gum season hundreds of boats may be seen lined up against the bank waiting for cargo. At El-Dueim are the headquarters of the White Nile Province, and the residence of the Governor. It possesses streets or lanes of houses, with sun-dried mud walls and flat roofs.

We have now accomplished 1,000 miles of our voyage down the White Nile on board the Sudan Government stern-wheel steamboat. The steersman or reiss is a big black Sudanese, while the English official in charge is an engineer, in accordance with an ordinance of Lord Kitchener. So you have an engineer in charge of everything, while the reiss is responsible for the navigation.

Next day we pass a large solitary tree on the right bank of the river. It is the more remarkable because for some miles the river banks have been low, flat and treeless: the monotony only broken by the flight of birds and the enormous flocks of sheep and herds of cattle cropping the short grass or drinking at the water's edge. But this tree compels our romantic veneration, because it is the point to which the ever-lamented General Gordon used to ride out, in his moments of relaxation, from Khartoum for the sake of exercise. Hence it is called "Gordon's Tree."

And now Omdurman comes in sight, bathed in hot, golden sunshine. Omdurman, which was the trading metropolis of the Sudan! Omdurman, the great desert city, whose river frontage extends for nearly seven miles! On whose sloping banks a busy boat traffic is at work with chatter and clatter, everyone talking at once and at the top of their voices! Omdurman, where Mahdi and Khalifa held their ruthless sway! Omdurman, with crowded streets and bazaars, fascinating in a savage, barbaric kind of way! The main street is Eastern to a degree; its flat-roofed, irregular, sun-dried, mud houses possess no claim to architectural beauty according to our Western notions. Yet Omdurman fascinates notwithstanding the heat, the glare and the dust! The tramway seems out of place in this old-world oriental town. It is a steam tram, which connects the furthest point of Omdurman with the ferry-boats from Khartoum.

Turning out of the Sukh, or market, is the Silverworkers' Bazaar. In each house in this bazaar you will find a native silversmith sitting on his heels on the dusty floor, working away with his hammer and graving tools, fashioning the amulets, bangles and other silver ornaments, apparently so necessary to the dress of the Sudanie.

Coming from Lancashire, my thoughts naturally turned to cotton and calico. In the Sukh was a native dealer in cotton cloths, grey and bleached and printed calicoes. Compared with the wilds through which we have passed Omdurman is now a civilized place; so here, where the Arab dress is so largely worn, there is a considerable demand for these goods.

We visited the Native Hospital, and saw Dr. Christopherson, the head, both of this hospital and of the civil hospital at Khartoum. With him were three nurses, Sudanie women, a man-servant and two doctors, one a Syrian and the other an Egyptian. Omdurman had a bad reputation for disease, particularly cerebro-spinal meningitis. During the time of the Dervishes the whole town was full of cesspits, which were merely holes dug in the ground and open to the air. Imagine this in the sweltering heat of the tropic sun! It is a marvel that the entire population was not swept off by fevers and epidemics! Since the British occupation the sanitary conditions have enormously improved. I looked at the Sudanese patients with curious interest. Many of them preferred to sit cross-legged *on* their beds, according to their natural habit rather than lie *in* their beds between the sheets. Most of them have got to trust the English doctor with a faith so childlike as to be as pathetic as it is beautiful.

Before leaving Omdurman let us pause a moment before the ruin of the Mahdi's tomb. You remember how the Mahdi imprisoned, with cruelty, many Europeans here in Omdurman, and how he murdered General Gordon when Khartoum fell. The black Sudanese believed the Mahdi to be a prophet, the chosen one of God. And when the Mahdi died the Khalifa encouraged this belief. Dervishes and people worshipped him almost as a god himself. To them, the Mahdi's tomb was indestructible; no human force could disturb it, and from this tomb the body of the Mahdi would direct the faithful to victory and everlasting reward. So it was given out, and so it was believed.

You remember how, in 1898, Lord Kitchener completely routed the Dervish army at the battle of Omdurman, thus at once avenging Gordon's murder and restoring British honour. The Khalifa fled from Omdurman, and the Sirdar, Lord Kitchener entered. But the Mahdi's tomb remained, a symbol of revolt, an incentive to rebellion in the name of religion; for the black people believed that the Mahdi was only sleeping and would come forth to drive away the white conquerors. Now, Kitchener was a wise man. He saw clearly that if future bloodshed was to be avoided, faith in the Mahdi and in Mahdism must be destroyed. He ordered the tomb to be destroyed and the Mahdi's body to be removed. Dervishes and the people heard the decision. "Ah!" they murmured, "will those Christians dare? The Mahdi will come out and slay them." So Kitchener's gunboats pounded the tomb with shells, from the river. The dome of the tomb fell a mass of debris. The body was thrown into the river; it held up no avenging arm and passed away to destruction. Heaven made no sign, and the amazed people murmured again: "Had the Mahdi lied? Had he no power after all?" Thus was Mahdism extinguished in the Sudan and, Lord Kitchener displayed his wonderful grasp of the Oriental mind.

Our journey is almost over. Half an hour from Omdurman brings us to Khartoum, where the Blue Nile comes into our White Nile and they flow together a united Nile through Nubia and Egypt. We have now travelled together 1,100 miles from latitude 4° 45′ to 15° 36′.

The principal street of modern Khartoum is very wide, as are also the other main streets, and has a steam tram-train, which runs to the Omdurman ferryboat. In the street are flat-roofed shops or stores, with no chimneys. The "War Office" is an imposing-looking building, in which, to a great extent, the administration of the Sudan is so admirably carried on. There is a constant stream of people—black, Sudanese, British officers and Egyptian officials—perpetually passing in and out of this building. The public buildings of modern Khartoum are very fine. The new Mosque is an example. It is built of a stone, presumably a sandstone, quarried in the Kerreri Hills beyond Omdurman. The cornice of the main building and the minarets are built of sandstone from Gebel Auli. This large mosque tells you at once how large a section of the Khartoum community is Mohammedan; in the Sudan, Islam is working hard proselytizing the heathen tribes and Islam is making headway. It behoves Christianity to labour unceasingly for the cause of Christ, of humanity and of civilization, for there is great danger that the crescent may outstrip the cross in Central Africa. The new Cathedral at Khartoum was opened in January, 1912, and, like the minarets of the Mosque, the Cathedral is built of sandstone from the quarry in Gebel Auli, a volcanic hill on the right bank of the White Nile, 21 miles south of Khartoum. Eventually a ridge-roof is to be placed over the roof archings. I attended an impressive service here.

The literal meaning of the word "Khartoum" is "Elephant's Trunk." The city is built upon the angle of land between the confluence 'of the White and Blue Niles. The curve of this angle of land somewhat resembles an elephant's upraised trunk, hence the name. The modern city of Khartoum faces the south bank of the Blue Nile. The Government docks and workshops are across on the north bank of the river. Until two years ago communication between Khartoum and Khartoum North was maintained by a ferry steamer. In 1910 there was opened a splendid seven-span bridge. One span opens to allow steamers and sailing vessels to pass up or down the Blue Nile.

The first idea of connecting the Sudan with Egypt by railway is due to the Khedive Said Pasha as far back as 1860, but it was not until the year 1897, on New Year's Day, that the present main line from Wady Halfa was commenced. Work proceeded with great energy, and the railway was laid at the high average rate of about a mile a day. Khartoum North was reached 31st December, 1899. Thus the 575 miles of railway, from Wady Halfa to Khartoum, was laid just within the three years. Khartoum North remained the terminus for eleven years, and then, two years ago, in 1910, this magnificent bridge brought the Sudan Government Railway into the Khartoum Central Station. The railway is already largely contributing to the increasing prosperity of the Sudan, and is rewarding the foresight and enterprise of the Anglo-Egyptian Government. This bridge serves a threefold purpose; it carries the railway, the high road and the tramway across the river. We travelled by rail from Khartoum over this bridge across sandy desert and past scrub, kopje and rocky mountain, the 200 miles to Atbara, the first stage of our journey home.

But we cannot leave Khartoum without a thought of General Gordon's memory. In the autumn of 1884 he, as Governor-General of the Sudan, was shut up in Khartoum by an overwhelming force of Dervishes and fanatics under the Mahdi. Gordon knew that a British expedition was laboriously fighting its way to his relief. The garrison of Khartoum was now getting weaker and weaker through famine; and, though Gordon despatched cheery messages to say that he "could hold out for years," he knew that it would be all over with Khartoum if the expedition did not arrive quickly. The expedition did arrive at noon on the 28th January, 1885, to find that Khartoum had fallen two days previously and that General Gordon, instead of being taken a prisoner of war, had been murdered on the stairs of the Sirdar's palace.

We have already seen how this foul crime was avenged by Lord Kitchener at the battle of Omdurman. But perhaps the crowning act which causes Lord Kitchener's name to be revered in the Sudan was his collection of money for building the Gordon College. This college, with an endowment of over £100,000, was finished and opened in October, 1903. It is built of red brick, which the powerful tropic sun has bleached to a warm pink. Here are comprised two training or 'normal' colleges—vernacular and English. The curriculum comprises all branches of educational effort from the primary school to the scientific laboratories. In one wing of the college there is a splendid laboratory for bacteriological, entomological and chemical research, the gift of Mr. Wellcome. The work of the Wellcome Research Laboratories is highly valued in the Sudan and in equatorial Africa. In the upper school technical training for engineers and surveyors is provided. A valuable adjunct to the college are some technical workshops, in which native youths are trained to various trades. These workshops were generously fitted up by a Manchester man, and a member of our Geographical Society—Sir Wm. Mather.

Altogether the Gordon College is a splendid memorial to a great hero, and a memorial, than which, that hero, I am confident, would have desired none better. A bronze statue of the martyred hero stands in Khartoum in a central position from which all roads practically radiate, and it is an appropriate spot at which to bid farewell to Khartoum and the Sudan, for you will have noticed that our journey has lain entirely in the Sudan.

Now the natives have a saying that "When Allah made the Sudan he laughed." A writer, commenting on this saying, asked a native "why Allah laughed." The Sudanie replied simply, "Because it was Allah's best work." Does this not point a moral to ourselves? We British hold the paramount influence in the Sudan. The Sudanese natives are just emerging from the darkness of oppression, cruelty, ignorance and fanaticism. Many of our fellow countrymen are out there, giving the best of their lives for the physical and moral improvement of the people. Be it ours then to back them up with national support, until in the fulness of time, contemplation of the new Sudan will cause Christianity and civilization to laugh for joy.

THE NORWEGIAN SOUTH POLAR EXPEDITION.*

By Captain Roald Amundsen.

(Lecture, entitled "How We Reached the South Pole," addressed to the Society in the Free Trade Hall, on Friday, November 29th, 1912.)

While the struggle for the North Pole covers hundreds of years, the struggle for the South Pole is of comparatively recent date. About 1900 we find several expeditions—English, German, French, Belgian, Scottish, and Swedish—working hand-in-hand in order to withdraw the veil and lay open the great mysteries of the Antarctic. The object of several of these expeditions was of course scientific, but I believe I may say that the Pole itself loomed behind as the ultimate goal.

My time to-night does not permit me to review all the expeditions that have contributed to increase our knowledge of the great unexplored section of the Antarctic continent. I shall mention only the expeditions which earlier have done work in the region, where we had to look for our starting-point. Our goal being to reach the South Pole, we first of all had to push forward with the ship as far south as possible and there build our station. The sledge journey would be long enough, anyway. I knew that the English would go to their old winter quarters in McMurdo sound, South Victoria Land. The newspapers had stated that the Japanese had reserved King Edward VII. Land. Thus there was nothing else for us to do, but to build our hut on the barrier itself, as far from these two expeditions as possible, in order not to be in their way.

The great Antarctic barrier, or the Ross barrier as it is called, between South Victoria and King Edward VII. Land, has an extent of about 450 geographical miles. The first who met with this enormous glacial formation was Sir James Clark Ross in 1841. He, naturally enough, did not take the risk of running his two sailing vessels, *Erebus* and *Terror*, close under the mighty 100-feet high ice-wall, which barred his progress towards the south. But he examined it as well as circumstances would permit at a reasonable distance. These observations made it clear that the barrier was not a straight, steep ice-wall, but was broken at intervals by bights and small inlets. In the chart of Ross we shall notice an imposing bay-formation in 164° W. and 78° 30′ S. The next expedition that sailed down to these regions was the Southern Cross expedition in 1900. It is interesting that this expedition found this bay in the same place, where Ross saw it in 1841—sixty years earlier. As interesting is it, that this expedition succeeded in landing in a little bay—Balloon bight—some miles to the eastward of the big one, and from there climbed up on the barrier, which up to this time had been considered inaccessible and an invincible hindrance for an advance towards the south.

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In 1901 the *Discovery* steamed along the barrier and confirmed in every respect what the Southern Cross expedition had observed. The expedition also succeeded in discovering land in the direction mentioned by Ross—King Edward VII. Land. Scott also landed in Balloon bight and observed, like his predecessors, the big bay formation to the west.

In 1908 Shackleton in the *Nimrod* followed, like his predecessors, the barrier, and arrived at the conclusion that disturbances in the barrier had broken away the shore-line of Balloon bight, merging that indentation into the bay to the west. To the big newly formed bay he gave the name the "Bay of Whales." But his original plan of landing here was abandoned—the barrier in the place looking too dangerous as a foundation for winter quarters.

When the two charts are compared, it was not difficult to decide that the bay put down on the chart by Ross and the Bay of Whales was one and the same. Though some few pieces had broken off here and there, this bay had remained constant for about seventy years. It was an obvious conclusion that the bay was no casual formation, but owed its existence to subjacent land, banks, etc. This bay was selected as our basis of operation. It is 350 nautical miles (650 kiloms.) from the English station in McMurdo sound, and 100 nautical miles (185 kiloms.) from King Edward VII. Land. It therefore seemed to us that we were at a sufficient distance from the English sphere, and need not fear that we should come in their way. The reports of the Japanese on King Edward's Land were rather vague, and it seemed to us that a distance of 100 miles was more than enough.

On board of Nansen's old well-known vessel, the *Fram*, we left Norway on August 9, 1910. We carried on board ninety-seven fine Eskimo dogs from Greenland, and provisions for two years. The first port we touched was Madeira, where we finally made everything ready for the long voyage to the Ross barrier. It was no short distance we had to cover—about 16,000 nautical miles (29,600 kiloms.)—from Norway to the Bay of Whales. We had calculated that it would take us five months to make the trip. The *Fram*, which with good reason is said to be the most solid polar ship in the world, proved to be exceedingly seaworthy on this long voyage over pretty nearly all oceans. Thus we sailed through the north-east and south-east trades, the roaring forties, the foggy fifties, and the icy sixties without any mishap, and arrived at our sphere of work at the barrier on January 14, 1911. Everything had gone unusually well.

The ice in the Bay of Whales had just broken up, and to such an extent that we succeeded in sailing quite a distance further south than any of our predecessors, and found a little cozy corner behind a projecting ice-cape, from which we, in comparative safety, could bring our outfit on to the barrier. Another great advantage was that the barrier here sloped very gently down to the sea ice, and this gave us the best ground for sledging. The first thing we did on our arrival was to climb the barrier to examine the nearest surroundings and find a convenient place for the house we had brought from home. The supposition that this part of the barrier rested on subjacent land the surroundings at once seemed to confirm. Instead of the plain, smooth surface that the outer barrier wall shows, we found the surface here greatly disturbed. Steep hills and crests, with intervening dales, filled with huge hummocks and pressure ridges, were seen everywhere. And these formations were not of recent date. It was easy to notice that they dated from a time far beyond the days of old father Ross. Our original plan was to build our station several miles from the barrier edge in order to guard us against an unwished-for sea-trip, in case the part of the barrier, on which our house was built, should break off. But that was not necessary. The formations we met on our first examination were warrant enough for the barrier's stability in this region. In a little valley 2 nautical miles ($3\frac{1}{2}$ kiloms.) from the spot where we had made fast the ship, well sheltered against all winds, we selected the place for our winter quarters. On the following day we commenced to discharge the ship—materials for housebuilding, outfit and provisions for nine men for several years. We were divided into two parties, the ship and the shore party. The first consisted of the master of the ship, Captain Nilsen, and the nine men, who would stay on board to navigate the *Fram* out of the ice and up to Buenos Aires. The other party consisted of those of us who would go into winter quarters and march towards the south. It was the duty of the ship's party to unload everything from the ship on to the ice. There the shore party took it and drove it to the spot we had selected for our house. In the beginning we were a little unaccustomed to this work, untrained as we were after the long voyage. But it didn't take long before all of us were well trained, and then everything went along at a dizzy speed between the ship and our future home, Framheim, which daily increased in size. As soon as all the materials for the hut had been driven up, our experienced carpenters, Olav Bjaaland and Jörgen Stubberud, commenced to erect the house. It was a ready-built house, and now there was nothing to do but to put together the different parts, all of which were marked. That the house might be able to withstand all the storms we expected, the site was excavated to a depth of 4 feet below the barrier surface.

On January 28, fourteen days after our arrival, the home was ready and the provisions ashore. A giant work had been done and everything promised well for the future. But time was precious, and it was our duty to make the best of it. The shore party was again divided into two. One would go on driving up from the ship the rest of the stores, outfit, and the like, while the other would prepare for a trip southward for the purpose of exploring our immediate surroundings and establish a depôt. On February 10, the last-named party was off. We were four men, eighteen dogs and three sledges, fully laden with provisions. How well I remember that morning, when we for the first time made our way towards the south! It was calm and slightly overcast. Ahead of us the vast, endless snow-plain; behind us the Bay of Whales with the great prominent ice-capes, and at the further end of the bay our dear *Fram*. The flag was hoisted, a last farewell from our comrades on board. Nobody knew when we should see them again. Most likely they would be gone when we returned, and then a year would elapse before we should see them. Another look behind, another farewell, and then southward. This first trip of ours

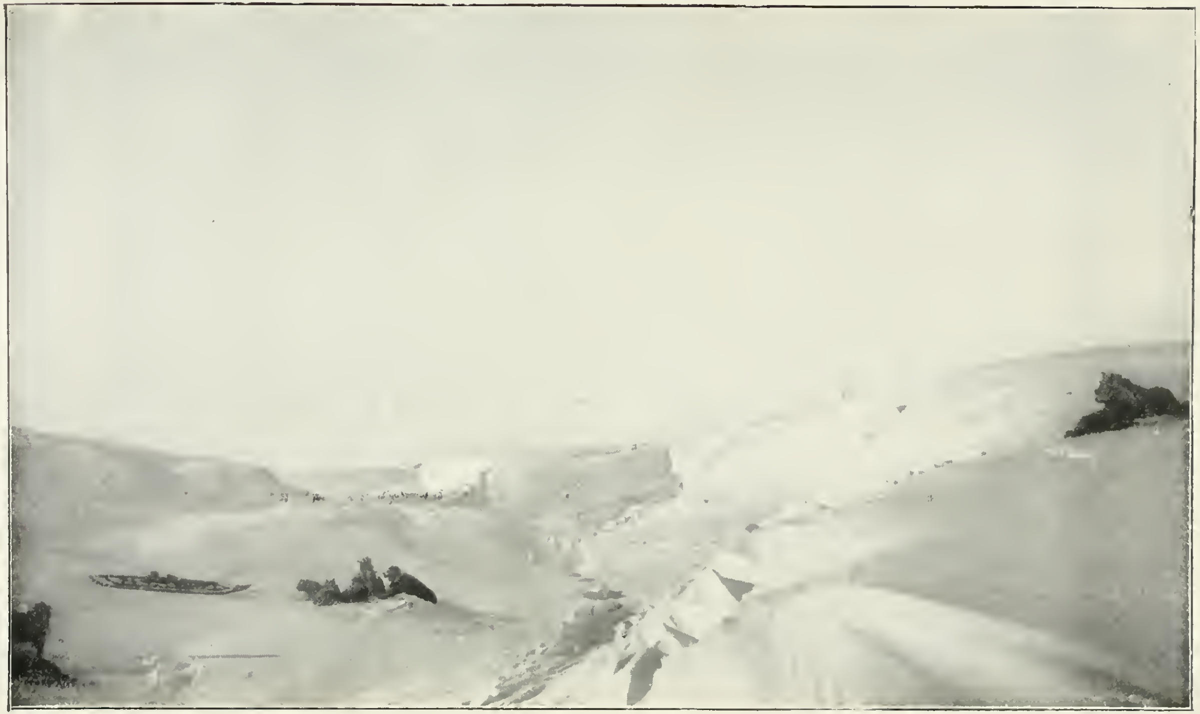

Fig. 1. Antarctica. Broken Country on the Ice-Barrier.

on the barrier was an exciting one. What would the region be like? How about the sledging? Did we have the proper outfit? Did we have the right traction power? If our task should be solved, everything had to be of the best. Our equipment was essentially different from that of our English competitors. We pinned all of our faith to our dogs and ski.

We travelled fast on the smooth, flat snow-plain. On the 14th we reached 80° S., having travelled a distance of 85 nautical miles (160 kiloms.) and established a depôt, consisting chiefly of provisions to be used on our main march towards the south, when spring came. The weight of the provisions was 1,200 lbs. The return trip was made in two days. The first day we travelled 46 nautical miles (75 kiloms.), and the second day 50 nautical miles (93 kiloms.). On our arrival at the station, the *Fram* had sailed. The bay looked dreary and desolate. Seals and penguins had taken possession of the place. Our first trip southward, however short, was of great importance. We now knew to a certainty that our equipment and traction power was of the very best. No errors had been made in the selection of the same. Now it was for us to use them in the best manner possible.

We did not stay long at home. On the 22nd we were once more ready to carry our depôts towards the south. The intention was to take them as far south as possible. We were eight men, seven sledges, and forty-two dogs. The cook alone stayed at home. On the 27th we passed the depôt in 80° S., where everything was in first-class order. On March 4, we made lat. 81° S., and deposited there 1,050 lbs. of provisions. From here three men returned, while five men continued their way southward and on March 8 reached 82° S., where 1,250 lbs. of provisions were left. We then returned, and were at home again on the 22nd. Once more before the winter set in we were in the field, and carried 2,200 lbs. of fresh seal-meat and 400 lbs. of other provisions to the depôt in 80° S. On April 11th the trip was completed, and all the depôt work had come to an end. Up to this time we had carried 7,500 lbs. of provisions, distributing them at the three depôts.

The part of the barrier over which we had travelled had an average height of about 150 feet, and looked like a smooth plain, rising in great waves or undulations without characteristic marks of any kind. It has been the common opinion that depôts might not be laid out on such an endless plateau without an imminent probability of losing them. But if there should be any chance for us to reach our goal, we had to lay out depôts, and that even on a large scale. We talked much over the question, and arrived at the conclusion that we must use signals athwart our course instead of along it as is commonly the case. Consequently, we put down a line of flags at right angles to our course, that is, in an east-west direction, with the depôt as central point. Each of the three depôts was marked in this manner, 5 nautical miles (9 kiloms.) on each side of the depôt, and half a mile (1 kilom.) between each flag. Besides, all of the flags were marked, so that we, wherever we met them, were able to know in which direction lay the depôt and how far we were from it. This plan proved to be absolutely reliable, and even in the densest fog we succeeded in finding our depôts. Our compasses and distance metres were examined at the station, and we knew that we could depend upon them.

We had gained much on our depôt trips. Not only had we succeeded in carrying plenty of provisions southward, but we had acquired a lot of experience, which was possibly more important and came in handy on our final dash for the pole. The lowest temperature observed on these depôt trips was −50° Fahr. Considering that it was still summer when this temperature was observed, it was a serious warning to us that we must have our equipment in good order. We had also seen that our solid, heavy sledges were too clumsy, and that without risk they could be lightened considerably. The same could be done with the greater part of our other outfit.

Some days more were spent on a seal hunt, before the sun disappeared. The total weight of the seals killed amounted to 120,000 lbs. Thus we had provisions in plenty for ourselves as well as for our 115 dogs. The first thing we did was to give our dogs a shelter. We had brought with us ten very big tents, large enough to accommodate sixteen men. They were pitched on the barrier, after which the snow under each tent was dug out, 6 feet down, so the ultimate height of the dog-houses became 18 feet. The diameter of the floor was 15 feet. Our intention in building these houses so large was to make them as airy as possible, in order to avoid the hoar frost so annoying to the dogs. We achieved our object. Even during the most severe period of the winter no frost could be noticed. The tents were always cozy and warm. Each tent had room for twelve dogs, and every man had his own team to look after.

Having thus cared for our dogs, the turn came to ourselves. Mother nature had stretched out a helping hand, and we were not slow in catching it. In April the house was completely covered with snow. In this newly drifted snow were made excavations in direct communication with the hut. Thus we got large and spacious rooms without buying or fetching materials. There were workshops, forge, sewing room, packing room, a space for coal, wood and oil, ordinary bath and steam bath. However cold and stormy the winter might be, it would not annoy us at all.

On April 21 the sun disappeared, and then began the longest night ever experienced by men in the Antarctic. We had no fear of meeting it. We had provisions enough for years, a cozy house well ventilated, well lighted, and well heated, with an excellent bath—a complete sanatorium, indeed. As soon as all these buildings were finished we began to make preparations for the final journey in the spring. Our business was to improve our equipment and reduce its weight. Thus we condemned all our sledges. They were too heavy and clumsy for the smooth surface of the barrier. The weight of such a sledge was 150lbs. Our ski and sledgemaker, Bjaaland, took care of the sledges and did all the necessary work concerning them, and when the spring came, a complete new sledge outfit was ready from his hand. These sledges weighed only one-third of the original ones. In a like proportion we succeeded in reducing the weight of everything. Of the utmost importance was the packing of the provisions selected for the trip. It was the work of Captain Johansen during the winter. It had to be done with care and attention. Of the 42,000 biscuits that were packed, each and every one was turned in the hand, before the right place for it was found. In this manner the winter passed quickly and comfortably. Every one had his hands full all the time; our house was warm and dry, light and airy; consequently, the health of everybody was excellent. We had no physician, and we didn't need one.

Meteorological observations were taken all the time; the results were surprising. We believed that we should encounter unpleasant, stormy weather, but it proved to be contrary to expectations. During the whole year we stayed there we didn't have more than two moderate storms, for the rest calm and light breezes—mostly easterly. The atmospherical pressure was mostly very low, but steady. The temperature became very low, and it is probable that the mean temperature for the year, −14°·8 Fahr. (−26° C.), which we observed, is the lowest mean temperature on record. In five months of the year we had temperatures below −58° Fahr. (−50° C.). On August 13, we had the lowest temperature observed, −74° Fahr. (−59° C.). The aurora australis was very frequent in all directions and shapes; it was extremely lively, but not very intense. There were, however, a few exceptions.

On August 24 the sun returned; the winter was over. Some days before we had all our things in full order, and when the sun peeped over the barrier everything was ready for a start. The dogs were in excellent condition, some of them too much so. From now on we watched the temperatures daily. As long as the glass remained as low as −58° Fahr. (−50° C.), there could be no question of starting. In the first days of September there was every sign that it would rise, and we therefore resolved to push off as soon as possible. On September 8 we had a temperature of −31° Fahr., and off we were. But this trip could not be one of long duration. On the following day the temperature began to go down rapidly, and within a few days we had −72°·5 Fahr. (−58° C.). We human beings might have kept going for some time in this temperature, well clothed as we were, but our dogs could not stand it very long. We were therefore satisfied to reach 80° south, and arriving there we laid all our provisions and outfit in the old depôt and returned to Framheim.

Now came a period of doubtful weather, the change from winter into spring, and we never knew what the next day would bring forth. Some frost-bitten heels from the last trip forced us to wait until we knew for certain that the spring had come in earnest. On September 24 the first obvious sign of the spring appeared—the seals began to go up on the ice. This sign was welcomed with rejoicing and not least the fresh seal meat, which Bjaaland brought in that very day. The dogs also appreciated the sign of the spring. They were especially fond of fresh blubber. On the 29th appeared another and more obvious sign—a flight of Antarctic petrels; they were flying round the house, to the delight of the men as well as of dogs. The dogs were wild with joy and excitement, ran after the birds and stupidly counted on a delicate bird for dinner; the

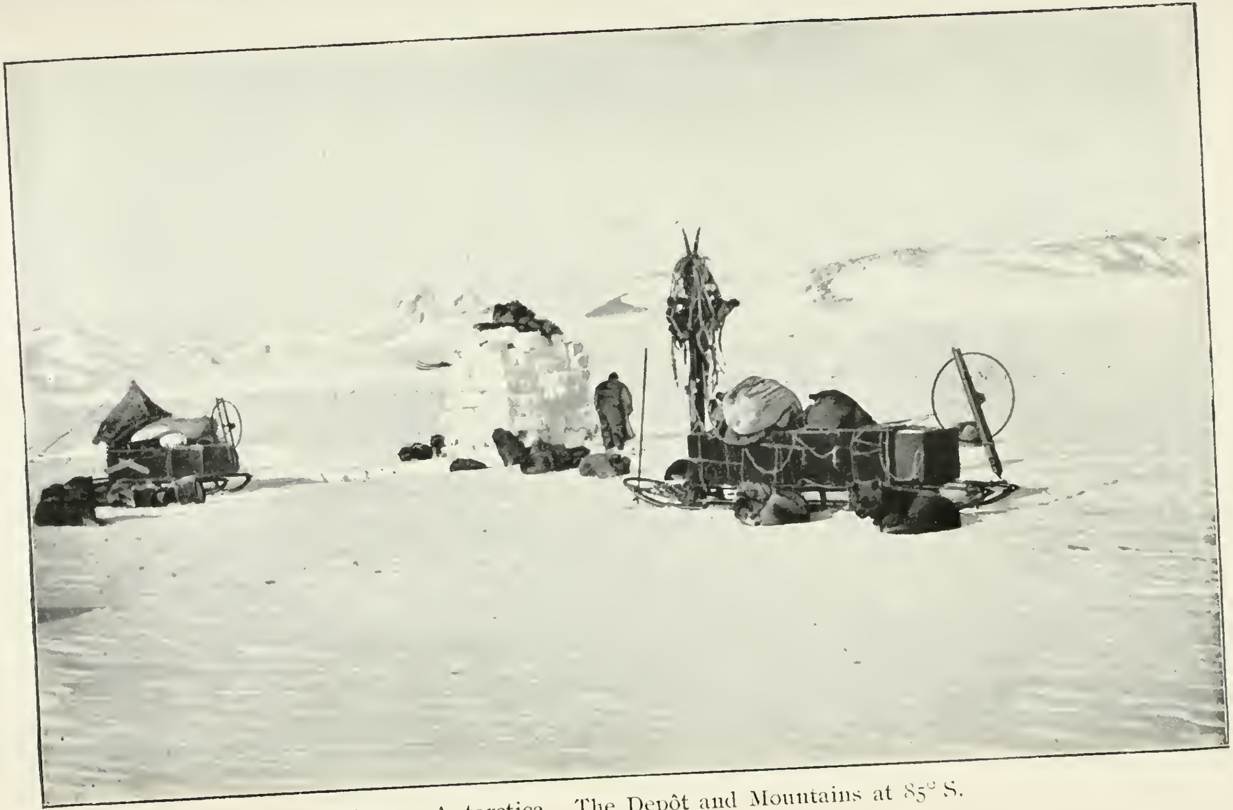

Fig. 2. Antarctica. The Depôt and Mountains at 85° S.

hunt resulted in a wild fight. At last on October 20 the weather had settled so much that we were able to start. The original plan, that all of us should march southward, had been changed during the interval. We understood that without risk we could divide into two parties, and in this manner do considerably more work. We had arrived at the decision, that three men should go east to King Edward VII.'s Land and examine it, while the other five should carry out the main plan —the dash for the pole.

October 20 was a fine day. Clear and mild; −1° Fahr. We were five men, fifty-two dogs, and four sledges. Our sledges were light, and the going was lively. It was not necessary to cheer the dogs, they were willing enough without. With our depôts in 80°, 81° and 82°, we had provisions for 120 days. Two days after our departure a serious accident nearly happened, Bjaaland's sledge falling down one of the many crevasses we had to pass over that day. He got assistance at the last moment, but it was in the nick of time, or his sledge with the thirteen dogs would have disappeared in the apparently bottomless pit.

On the fourth day we arrived at our depôt in 80° S. Here we rested two days and gave our dogs as much fresh seal meat as they could eat. Between 80° and 81° in the direction we went, the barrier is smooth and fine with the exception of a few low undulations, and there are no hidden dangers. Quite different is it between 81° and 82°. On the first 15 miles we were in a perfect labyrinth of crevasses and pressure ridges, rendering the passage extremely dangerous. Big pieces of the surface have been broken off, and grinning abysses are met with everywhere. From these gulfs cracks are to be found in all directions, and the surface consequently is very unsafe. (See Fig. 1.) We passed this bit of road four times. The three first times it was such a dense fog, that we could not see many yards ahead of us. Only the fourth time did we get clear weather, and we saw then what difficulties we had escaped. On November 5th we reached the depôt in 82° S., and found everything all right. For the last time our dogs could get a good rest and plenty of food. And they got it thoroughly during a two-days' stay. In 80° we commenced to build snow mounds, intended to serve as track marks on the homeward trip. We erected 150 mounds in all. Sixty snow-blocks were needed for a single mound. Thus were 9,000 blocks cut for these marks.

The mounds proved to answer expectations, as by them we followed precisely the same route we had gone.

The barrier south of 82° was, if possible, still more smooth than to the north of that latitude, and we were marching along at a good speed. We agreed in laying down a depôt at each whole degree of latitude, on our way south. Undeniably we ran a risk in doing it, as there was no time for putting down cross-marks. But we had to be satisfied with the snow mounds and pin our faith to them. But, on the other hand, our sledges became so much lighter that they were never too heavy for our dogs. In 83° S., we sighted land in a south-westerly direction. It could be nothing else but South Victoria Land, and probably a continuation of the mountain range, running in a south-easterly direction, as drawn by Shackleton in his chart. From day to day the land became more distinct, one peak more magnificent than the next one—being from 10,000 to 15,000 feet in height, sharp cones and sharp needle-like spurs. I have never seen a landscape more beautiful, more wild, and more imposing. Here a weathered summit—dark and cold—there snow and ice glaciers pell mell in a terrible chaos. On November 11 we sighted land due south, and pretty soon ascertained that South Victoria Land in about 86°S. and 163°W. is met by a range trending east and north-east. This mountain range is considerably lower than South Victoria Land's mighty mountains. Summits from 2,000 to 4,000 feet were of the highest. We were able to see the range to 84° S., where it disappeared on the horizon. On the 17th we arrived at the spot where the ice barrier and the land are joined. We had all the time been steering due south from our winter quarters. The latitude was 85°, and the longitude 165° W. The junction between barrier and land was not followed by any great disturbances. A few large undulations broken off at intervals by crevasses. Nothing there could impede our progress. Our plan was to go due south from Framheim to the Pole, and not go out of the way unless natural obstacles should force us to do so. If we succeeded, we would thus be able to explore an absolutely unknown land, and to do good geographical work.

The nearest ascent due south was between the mighty peaks of South Victoria Land. Obviously there were no serious difficulties in store for us. We might probably have found a less steep ascent if we had crossed over to the newly-discovered range. But we had once taken the notion, that due south was

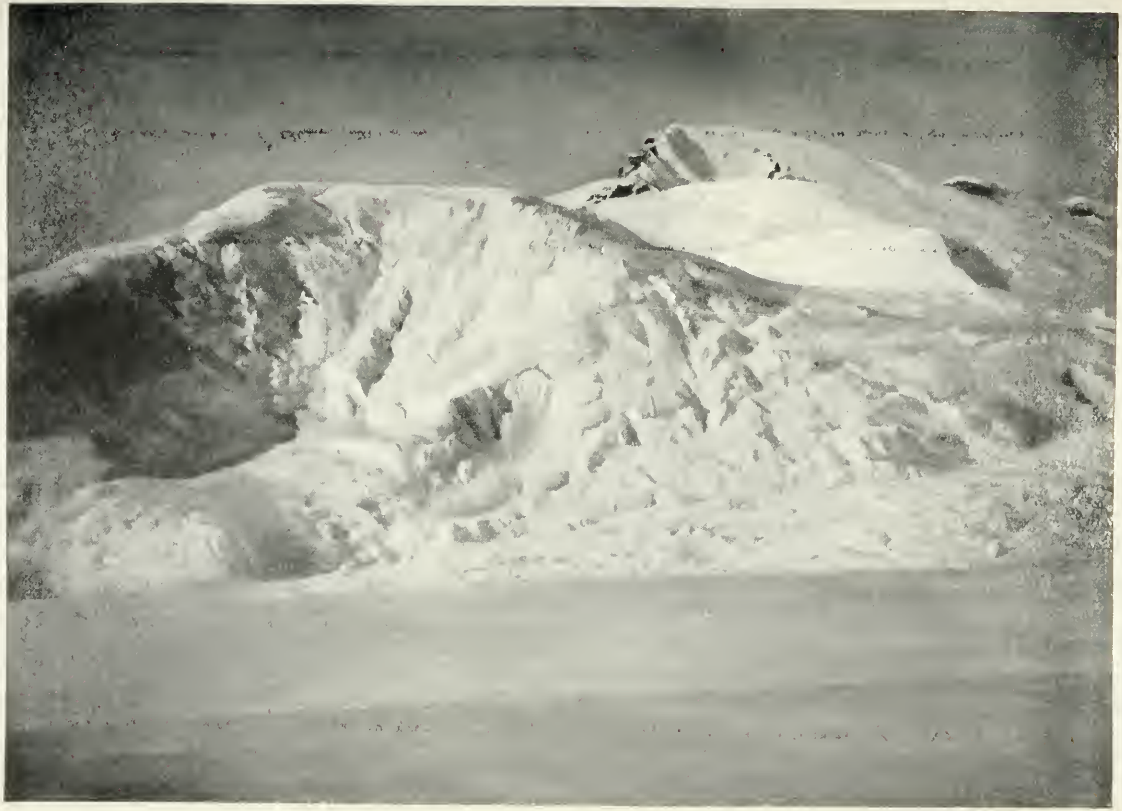

Fig. 3. Antarctica. Mount Don Pedro Christopherson.

the shortest way to the goal, and then we had to take the chances. On this spot we established our main depôt and left provisions here for thirty days. (See Fig. 2.) On our four sledges we carried provisions for sixty days. And up we went for the plateau. The first part of the ascent went over sloping, snow-covered mountain sides, in some places rather steep, although not bad enough to prevent each team managing to haul up their own sledges. Further up we met with some short, but very steep glaciers, in fact, they were so steep that we had to harness twenty dogs to each sledge. But now they went lively enough in spite of precipices which were so steep that we had the greatest difficulty in climbing them on our skis. The first night we pitched camp at a height of 2,000 feet. The second day we climbed mostly up some small glaciers, and camped at a height of 4,000 feet. The third day we unfortunately had to swallow the pill and descend about 2,000 feet, being surprised by a large glacier running east-west, which divided the mountains we had climbed from the higher peaks further south. Downhill the expedition went again at a dizzy speed, and in a very little time we were down on the before-mentioned mighty glacier, Axel Heibergs glacier. That night our camp was about 3,000 feet above sea-level. The following day began the longest part of our climb, we being obliged to follow Heibergs glacier. This glacier was in places filled with hummocky ice, the surface rising into hillocks and splitting into chasms, and we had to make détours in order to escape the broad chasms which open into great gullies. The latter were of course mostly filled, the glacier apparently having stopped every movement long ago. But we had to be very careful, not knowing how thick was the layer that covered. Our camp that night lay in very picturesque surroundings, the altitude was 5,000 feet above sea-level. The glacier here was narrowed in between the two 15,000 feet high mountains—Fridtjof Nansen and Don Pedro Christophersen mountains. (See Fig. 3.). To the west in the further end of the glacier rose mount Ole Engelstad to a height of 13,000 feet. The glacier was in this comparatively narrow passage very hummocky and broken by huge crevasses, so that our progress very often seemed to be impeded. On the following day we reached a slight sloping plateau, that was supposed to be the plateau described by Shackleton. Our dogs performed that day's work so well that their superiority once for all must be admitted. Added to the toil of the preceding weary days, they travelled this day 17 nautical miles (33 kiloms.), ascending 5,600 feet. We camped that night in an altitude of 10,600 feet. Now the time had come when, unfortunately, we were obliged to kill some of our dogs. Twenty-four of our brave companions had to lay down their lives. We had to remain here for four days on account of bad weather. When we at last broke up on November 26, we had only ten carcasses left, and these we laid in depôt. Some fresh provisions on our return trip would not do any harm. During the following days the weather was stormy and the snowdrift dense, so we were not able to see any of the surroundings. That much did we notice, that we were going downhill very fast. Once in a while when the drift lifted we saw high mountains due east. In the dense snowdrift on November 28 we were close under two peculiar-looking crests of mountains, running north-south, the two only peaks we observed on our right side. Helland Hansens mountains were wholly snowclad and had a height of 9,000 feet. They became later on an excellent landmark. The gale slackened the next day and the sun shone through. Then it appeared to us as if we were transported to an absolutely new country. In the direction of our course trended a huge glacier. On its eastern boundary was a range running south-east—north-west. To the west the fog was dense over the glacier and hid even the nearest surroundings. The hypsometer gave 8,000 feet above sea-level at the foot of "The Devil's Glacier," which means that we had descended 2,600 feet from the Butchery. It was no pleasant discovery. Without doubt we would have the same climb again and probably more. We established a six days' depôt and continued our march. From our camp that night we had a splendid view of the eastern mountain range. There was the most peculiar-looking peak I have seen. It was 12,000 feet high. The top of it was round in shape and was covered by a torn glacier. It looked as if nature in a fit of anger had showered sharp ice-blocks down on it. It was called Helmer Hansen mountain, and became our best landmark. And there were Oscar Wisting, Olav Bjaaland, Sverre Hassel mountains, glittering dark and red, glaring white and blue in the rays of the midnight sun. In the distance appeared the romantic mountain—enormous to behold through the heavy masses of clouds and fog, which from time to time drifted over, now and then exposing to our view their mighty peaks and broken

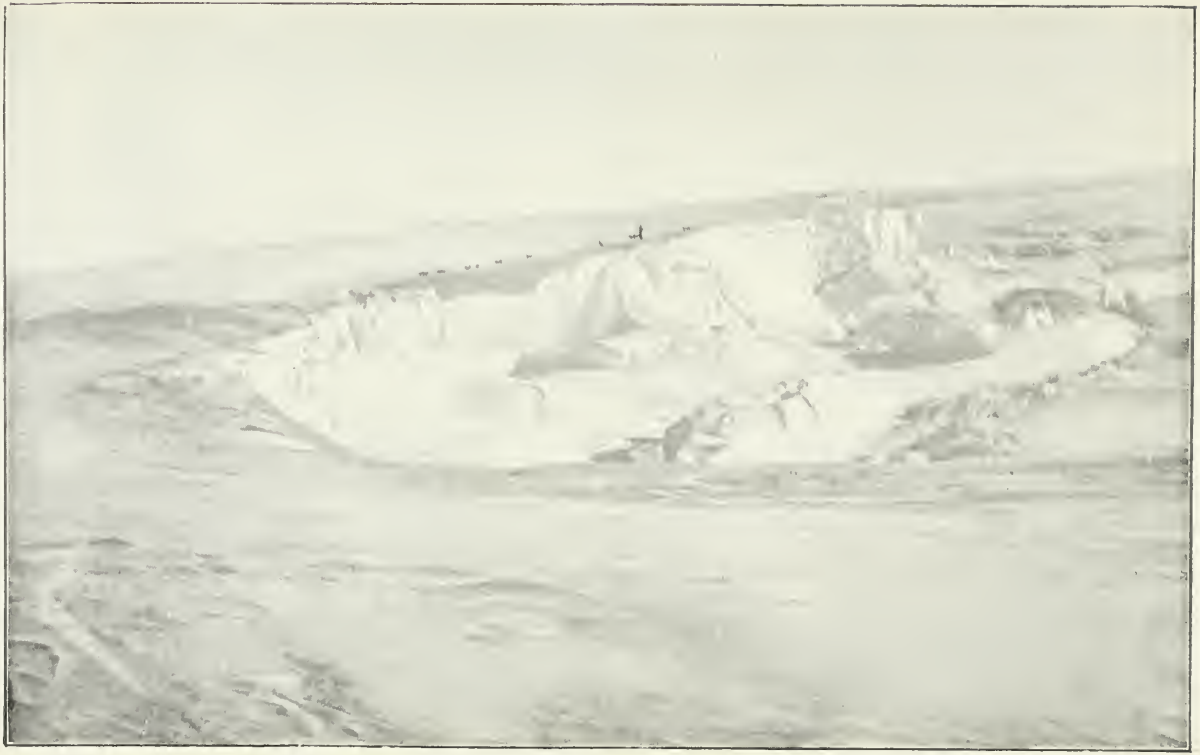

Fig. 4. Antarctica. Devil's Glacier, a large filled-up Chasm.

glaciers. Thus appeared Thv. Nilsen mountain for the first time. The height of it was 15,000 feet. It took us three days to climb the Devil's glacier. (See Fig. 4.) On December 1 we had left behind us this crevassed glacier, so full of holes and bottomless chasms. Our altitude was 9,100 feet. Ahead of us, and looking like a frozen sea in the fog and snowdrift, was a sloping ice-plateau studded with hummocks. The march over "The Devil's Dancing-room" was not entirely pleasant. Gales from south-east, followed by snowdrift, were of daily occurrence. We saw nothing, absolutely nothing. The ground below us was hollow, and it sounded as if we were walking on the bottom of empty barrels. We crossed this unpleasant and ugly place as quick and as light of foot as possible, all the time with the unpleasant possibility of being engulfed.

On December 6 we reached the greatest height—10,750 feet above sea-level, according to hypsometer and aneroid. From here the main inland plateau didn't rise any more, but ran into an absolutely flat plain. The height was constant as far as 88° 25′, from where it began to slope down to the other side. In 88° 23′ we had reached Shackleton's furthest south, and camped in 88° 25′. Here we established our last depôt—depôt No. 10, and deposited 200 lbs. of provisions. Then it began to go very slow downhill. The state of the ground was excellent, absolutely flat without undulation, hills or sastrugi. The sledging was ideal and the weather beautiful. We covered daily 15 nautical miles (30 kiloms.). There was nothing to prevent us from making a good deal longer marches, but we had time and food enough, and considered it more prudent to save the dogs and not overwork them. Without adventures of any kind we made latitude 89° on December 11. It seemed as if we were arrived at a region with perpetually fine weather. The most obvious sign of constant, calm weather was the absolutely plain surface. We were able to thrust a tent-pole 6 feet down into the snow without being met with any resistance. It is a proof, clear enough, that the snow has fallen in the same kind of weather—calm or very light breeze. Varying weather conditions—calm and gale—would have formed layers of different compactness, which would soon have been felt, when one stuck the pole through the snow.

Dead reckoning and observations had always given like results. The last eight days of our outward march we had sunshine all the time. Every day we stopped at noon to take a meridian latitude, and every evening we took an azimuth observation. On December 13 the latitude gave 89° 37′; dead reckoning 89° 38.′ In 88° 25′ we got the last good azimuth observation. Later on they were of no use. As the last observations gave pretty near the same result, the variation being almost constant, we used the observation taken in 88° 25′. We made out that we would reach the goal December 14. The 14th arrived. I have a feeling that we slept less, breakfasted at a greater speed and started earlier this morning than the previous days. The day was fine as usual. Brilliant sunshine with a very gentle breeze. We made good headway. We didn't talk much. Everybody was occupied with his own thoughts, I think. Or had probably all of us the same thought? Which brought all of us to look and stare towards the south over the endless plateau. Were we the first or?—Halt! It sounded like a sound of exultation. The distance was covered. The goal reached. Calm, so calm stretched the mighty plateau before us, unseen and untrod by the foot of man. No sign or mark in any direction. It was undeniably a moment of solemnity when all of us with our hand on the flag-staff planted the colours of our country on the geographical South Pole, on King Haakon VII plateau.

During the night—according to our time—three men encircled our camp, the length of the semidiameter being 10 nautical miles (18 kiloms.), putting down marks, while the two others remained at the tent, taking hourly observations of the sun. These gave 89° 55′. We might very well have been satisfied with the result, but we had plenty of time and the weather was fine, so why not try to observe the very pole itself? On the 16th we therefore moved our tent the remaining 5 nautical miles (9 kiloms.) further south and camped there. We made everything as comfortable and snug as possible in order to take a series of observations throughout the twenty-four hours of the day. The altitudes were observed every hour by four men with sextant and artificial horizon. The observations will be worked out at the Norwegian University. With this camp as a centre we drew a circle with a radius of 4½ nautical miles (8 kiloms.) and marks were put down. From this camp we went out for 4 miles in different directions. A little tent we had carried with us in order to mark the spot was pitched here, and the Norwegian flag with the *Fram* pendant hoisted on the top of the tent. This Norwegian home got the name "Polheim."

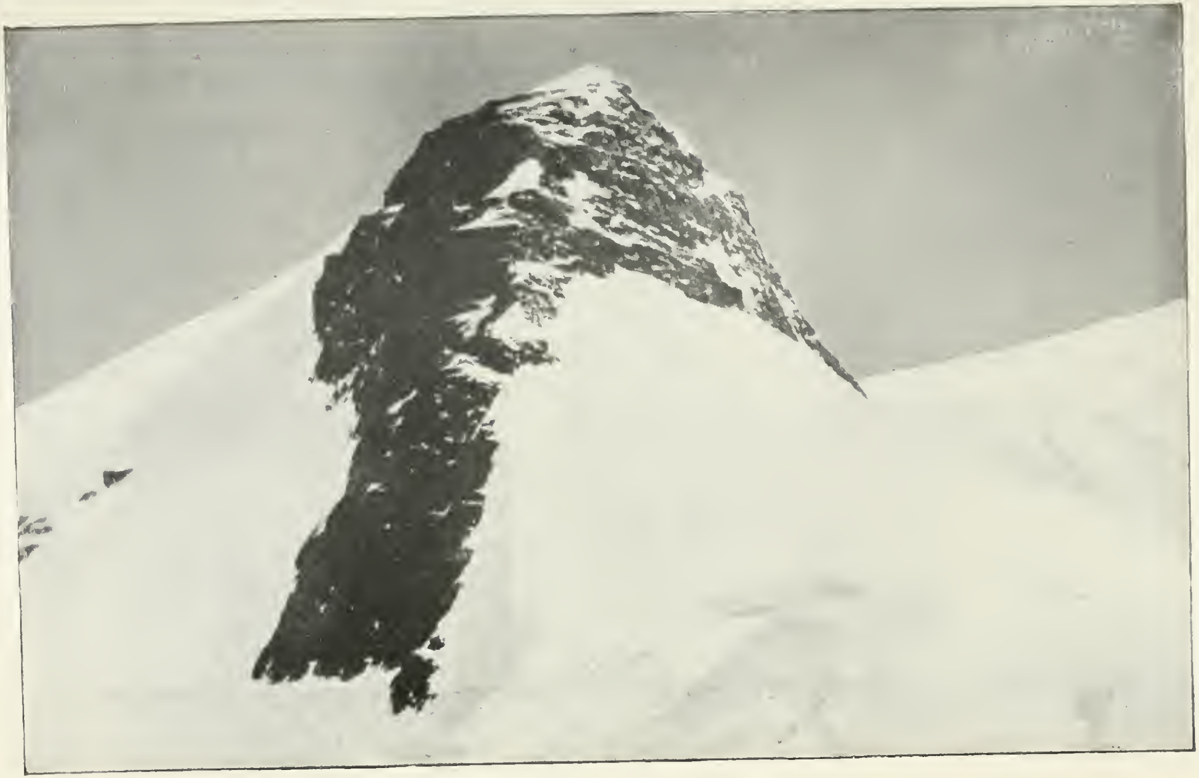

Fig. 5. Antarctica. Scott's Nunatak.

Judging from the weather conditions, this tent may stay here many years to come. In the tent we left a letter addressed to H.M. King Haakon the 7th, with information of what we had done. The next man will bring it home. Besides we left some clothing, a sextant, an artificial horizon and a hypsometer.

On December 17 we were ready to start on our return journey. The outward journey had according to distance-metres a distance of 750 nautical miles (1,400 kiloms.). The daily average speed had been 13 nautical miles (25 kiloms.). When we left the Pole we had two sledges and seventeen dogs. Now we enjoyed the great triumph of being able to increase our daily rations, unlike earlier expeditions, all of which were obliged to go on short commons—already at a much earlier moment of time. The rations were also increased for the dogs, getting from time to time one of their comrades as an extra. The fresh meat had a recreating effect on the dogs and contributed, no doubt, to the good result.

A last look and farewell to Polheim and then off. We see the flag yet. It was still waving at us. It is gradually diminishing. Then it disappears; a last good-bye from the little Norway on the South Pole. We left King Haakon's Plateau as we had found it, bathed in sunlight. The main temperature during our stay here was −13° Fahr. (−25° C.). It felt much milder.

I am not going to weary the audience with a detailed account of the journey. I shall only mention a few incidents of interest. The beautiful weather we got on our homeward run exposed to our view the whole of the mighty mountain range, that is, the continuation of the two ranges joined in 86° S. The newly-discovered range, trending in south-easterly direction, was everywhere studded with peaks of a height of from 10,000 to 15,000 feet. In 88° S. the range disappears on the horizon. The whole of the newly-discovered mountain ranges—about 460 nautical miles (850 kiloms.)—has got the name "Queen Maud's ranges."

All the depôts—ten in all—were found, and the abundant provisions, of which we at last had plenty, were taken along down to 80°, where they were deposited. From 86° we didn't go on rations, but everybody could eat as much as he liked. On January 25 we arrived at our winter quarters after an absence of ninety-nine days. The distance home, 750 nautical miles (1,400 kiloms.) was thus covered in thirty-nine days without a single day of rest. The daily average speed was 19·2 nautical miles (36 kiloms.). On our arrival we had two sledges and eleven dogs safe and sound. Not even a moment had we helped the dogs to pull the sledges. Our provisions consisted of pemmican, biscuits, milk in powder and chocolate. Not much of a variation, but a healthy, nutritious food which invigorated the body, just what it needed. The best proof was, that we always felt well and were never raving about food, which has been so common in all longer sledge journeys and an infallible sign of deficient nourishment.

In the meantime Lieutenant Prestrud and his two companions had succeeded in doing excellent work to the east and in the neighbourhood in the Bay of Whales. They succeeded in reaching King Edward's Land—discovered by Scott—and confirm what he had seen. Alexandra mountains appeared to be a wholly snow-covered crest—1,200 feet high—stretching in a south-easterly direction as far as the eye could see, the northern boundary being two bare peaks—Scott's Nunataks—1,700 feet high. (See Fig. 5.) This expedition's exploration of Framheim's surroundings is of great interest. It appears from their observations, that the Bay of Whales is formed by underlying land still snow-covered.

At the same time as our work inshore was going on, Captain Nilsen with his companions on the *Fram* succeeded in doing work which, from a scientific point of view, probably will turn out to be the most valuable of the expedition. On an 8,000 nautical miles' cruise from Buenos Aires to Africa and back, he took a series of oceanographic stations, sixty in all. Twice they circumnavigated the world, voyages full of dangers and toil. The voyage out of the ice in the autumn 1911 was of a very serious character. They were ten men all told. Through darkness and fog, cyclones and hurricanes, pack-ice and icebergs, it became their lot to beat their way out. Last but not least let me mention, that the same ten men, on February 15, 1911, hoisted the Norwegian flag further south than a ship has ever floated before.

A fine record in the century of records:—Farthest north, farthest south.

"FARTHEST WEST."

By Mrs. Salis Simon.

(Addressed to the Society in the Geographical Hall on Tuesday, November 5th, 1912.)

Hawaii.

We had left Japan, the Land of the Rising Sun and the farthest East, behind us on January 15th, and were steaming eastward now to the farthest West, whch we reached on the 20th. This place is clearly marked on all the maps, although no trace indicates it on the vast waters of the Pacific; it is the 180° of longitude, east and west of Greenwich. This is the place where the day begins and the sun is supposed to rise on a new morning. Now on our three months' journey so far we had been robbed every morning of from twenty to thirty minutes' sleep; every morning at six o'clock, the ship's clocks were put forward, and when we reached this exact spot we were twelve hours in advance of Greenwich time. Then the ship's officers presented us with these twelve hours and with an additional twelve hours on account for the rest of the journey, and we enjoyed two Saturdays, both dated January 20th, one of which I would gladly have been spared. It happened to be the worst and roughest day of our whole voyage, with tremendous waves breaking right over the captain's bridge and dashing spray through the skylights into the saloon on the highest deck.

At 9-15 we passed the meridian; the siren hooted, and now we were in the farthest West. Our course lay south-easterly, the storms, rains and heavy clouds of the North were left behind, and daily it grew warmer and more beautiful. The thermometer went up from 50° to 70° and 80° again, and soon we basked in semi-tropical sunshine. On January 24th we were in view of the Sandwich Islands. Our landing was marked by a rather dramatic incident. A pilot had, as usual, come on board to take the ship into dock, for in Honolulu, as in Manila, the Americans have built magnificent harbours and docks to accommodate even our enormous steamer. With the pilot had arrived a bevy of the most charming young and bright girls, almost white, tall and most elegantly dressed, laden with long wreaths of the loveliest fresh flowers. It is difficult to realise how much one appreciates fresh sweet-smelling flowers after ten days on board with nothing but sea and sky around! According to a century-old custom every guest on Hawaii's shores is received with garlands of flowers, and we had been warned not to refuse these tokens of welcome. We each had our wreath on shoulder or hat and stood chatting about the deck, waiting for the landing, when I suddenly noticed a backward movement as if we were putting out to sea. It was only for a few minutes, and then we came all right into dock, where an American man-of-war shared our accommodation. As usual a band of music greeted our arrival, and a deputation received us and distributed badges with "Aloha" (welcome) thereon. We landed and spent a delightful day on shore, and only at dinner, late in the evening, we heard what a strange and thrilling experience we had passed through. Captain Dempwolf came to our little table with a marconigram from Hamburg, and in an aggrieved tone related that it contained an anxious enquiry as to what damage we had caused to the man-of-war, our neighbour in the dock. Only then we learned that the pilot, though warned by the captain, had made a mistake in navigating our steamer and got so startled that he called out to the captain and fell down dead on the bridge with heart failure. The captain at once took command, backed out and brought us safely in without a scratch on the paint of the warship. But the news of the imminent collision was flashed across half the world, exaggerated as such rumours mostly are, and here was the Hamburg enquiry, the very first intimation of the occurrence of the morning. But it went the round of the European newspapers, and startled many of our dear ones whom we could not reassure quickly enough.

In blissful ignorance of the death of Captain Sanders, we went ashore on this most enchanting island, now one of the most flourishing colonies of the United States, erewhile the Cannibal Island, where Captain Cook was murdered and eaten. Beyond this incident its history goes back no earlier than 1821, when the first missionaries landed and built the first house with a roof, still shown as a curiosity in the town of Honolulu.

The Sandwich Islands are all volcanic, and on one of them, unfortunately too far for us to reach, there is a whole lake of fire in one of the active craters. Everywhere underground fires produce a marvellous fertility, and Hawaii proves no exception:

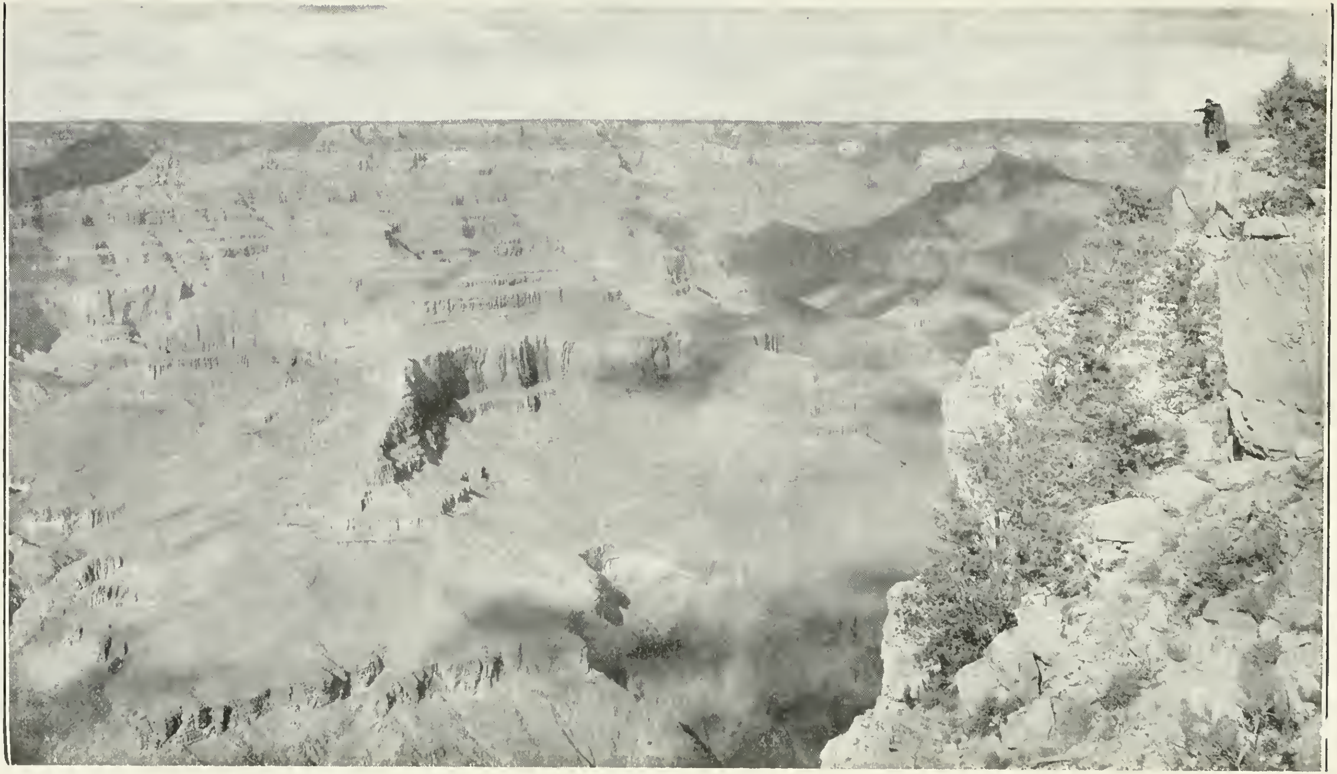

Fig. 1. Grand Cañyon, Arizona. Looking North-East from Pima Point.

these islands are a perfect paradise in the luxuriance of their vegetation. Stately royal palms form avenues; sugar cane, cotton, bamboo grow in the fields, and the flowers are indescribably beautiful. There is an old wall nearly half a mile long, so closely covered with a creeping cactus, that no stone is visible, and we were told that, in due season, some 20,000 of the gorgeous flowers could be seen at once. The sweet scent of gardenia and tuberose was wafted out to sea for a mile. Heliotrope, geraniums and gladiolus of a large, deep orange colour, grew wild, like ivy; and we noticed thick hedges of scarlet hibiscus, and of a fine shrub, the upper end of which shaded from deep green to a most delicate pink, exquisite in its effect. The pointsettia, with its flaming scarlet tops, had accompanied us from Egypt to the far East, flowering freely, like our hawthorn here, but it looked tired and worn-out in Hawaii.

The Hawaiian race is a very fine one—tall, muscular, intelligent and only slightly tanned; very distinct from all the races we had met heretofore. Unfortunately it seems a doomed race, although the Americans exert all their power to raise it. They have dwindled from 30,000 to 5,000 individuals since their civilization, although this put a stop to their continual little wars. Their language is a very poor one, containing only 500 words, which are formed, like baby language, of repetitions of certain syllables—Honolulu, Kakameha-meha. This is explained by their paucity of letters; they only have twelve, five vowels and seven consonants—you cannot do much with that!

After Captain Cook's tragic end savagery reigned over those islands, till American missionaries arrived, and then, in 1821, history began with King Kamehameha I and the Great. He managed to subdue the rival chiefs on the principal island, and ultimately conquered them in a terrible battle, in the course of which he drove some 5,000 warriors through a narrow gorge across the isle to a precipice—the Pali—over which he hurled the vanquished. He then established his dynasty, and the line lasted for a generation or two; but, as I mentioned before, these fine natives are doomed to extinction. Whether it is the delicious climate, tropical yet tempered by ocean breezes, or whether it is the constant intermarriage on these isolated islands in the mighty Pacific, anyhow the race turns out too indolent, pleasure-loving and even vicious, the royal descendants being no exception. The last Queen, Liliukalani, lives in honourable banishment in Washington; the palace built by the first king is now the administration building, and the Americans make excellent use of their enviable possession. In the magnificent museum is a wonderful garment, the most precious mantle in the world, of quite inestimable value. It is the royal coronation mantle of ample dimensions, and it is entirely composed of tiny yellow feathers. In a glass case close to this marvellous garment there is exhibited the little bird which provided the feathers. It is the size of a starling and is pitch-black, except for four of these tiny upturned feathers which mark the joint of the wings. You can imagine that this poor little bird became almost extinct on the islands. I understand that there is a similar mantle in the British Museum.

This museum forms the centre of a vast and magnificent educational scheme provided by one of the last branches of the royal house. Princess Berenice Powie married, some thirty years ago, a San Francisco banker (named Bishop), also very rich, and as they had no children, she left her vast fortune for the benefit of her race. Her husband survived her, and was, on the very day of our visit, celebrating his 90th birthday, a fête day for the whole island. The trustees of this bequest endowed some splendid schools for both boys and girls, the only condition of their admission being their Hawaiian nationality, if ever so distant. The Americans realised that the only salvation for this fine race lay in intermarriage, and encouraged it accordingly. The schools are scattered over quite a large area with many fine buildings. They contain farm lands and gardens, workshops, laboratories, drill grounds and a church. We spent a long and most interesting morning in going over the different parts, first of the boys' and then of the girls' schools. In the latter we found laundries and dress-making establishments, cookery and embroidery lessons, and all with the latest developments in labour-saving, electric and mechanical appliances. The boys can become expert farmers, mechanicians and electricians in these schools. But the headmaster, devoted to his task, did not believe in the future of the race, especially if intermarrying with Europeans continued. A mixture with the thrifty and frugal Chinese and Japanese seemed preferable in his judgment, based on close and constant observation.

The Bishop Museum contained innumerable treasures, gathered from all the scattered islands of the Pacific, as far

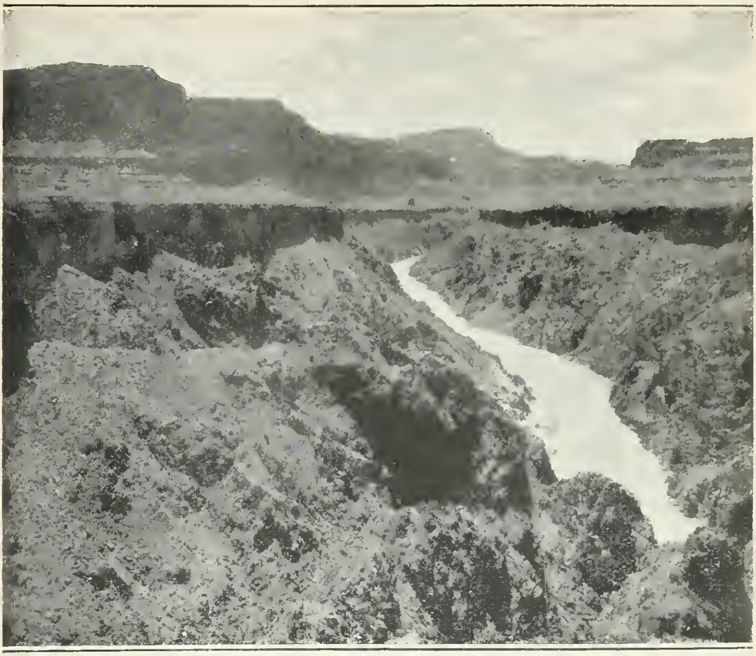

Fig. 2. Grand Cañyon. Colorado River.

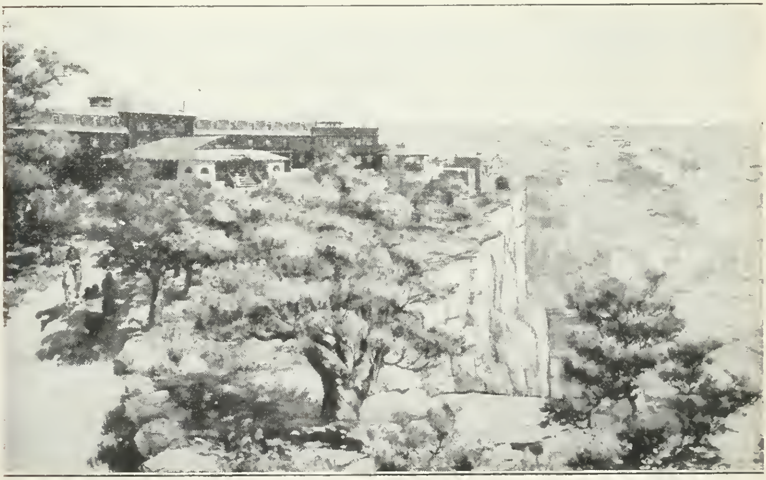

Fig. 3. Grand Cañyon. El Tovar Hôtel and Hopi House.
(Indian Reservation.)

south as the Samoan Islands. The most impressive was an octopus of immense size in the zoological section, an animal such as Victor Hugo or Wells describe in their most fantastic tales. The body would cover a good-sized dining table, and with its eight horrible arms it would fill the lecture hall.

The Honolulu Aquarium contained a specimen, about the size of a stool, which had a horrible fascination while sticking to the glass and wriggling its arms about in all directions. It is a hideous animal. In all other respects this aquarium proved the greatest charm of the enchanting island, and its tanks contained fish such as in our fairy tales we dream of. Fish of azure blue and coral pink darting about with silvery fins and eyes, boldly striped fish in broad bars of black and white or black and yellow, fantastically formed fish with yard-long streamers floating from their heads, silver and gold fish of quite huge dimensions formed a most wonderful collection that put the delicate corals, starfish and sea anemones quite out of conceit. In our walks and excursions we found little bays, where the water was exactly the sapphire blue in which those fish would hide, while the coral reefs surrounding the islands would shelter the pink species. These coral reefs, over which the breakers dash with the rising tide in even the calmest weather, provide the islanders with grand sport. Like the kindred race of the Malays, they are expert divers and swimmers from earliest infancy, but they cultivate quite an original art. They throw into the water heavy boards, about eight feet long and three feet wide. On these they strike out beyond the breakers. Then they suddenly stand erect on their boards, splendid bronze figures in the clear air, and on the waves they ride into the lagoon. They repeat this sport, called surf-riding, by the hour till the turn of the tide puts an end to it. All our party had been to lunch at the elegant Manoa Hotel. The lunch concluded with a whole pineapple for each of us. Imagine such gluttony. Each pineapple was partly hollowed out and refilled with fruit-ice, most delicious.

After lunch we sat by the seashore; many of our fellow travellers had brought or borrowed bathing costumes and swam or went in canoes beyond those breakers, letting their boat shoot back with them. That was on January 24th. The islands have such a glorious climate that winter and summer are alike, and, wonderful to say, it is never too hot. It is not necessary to interrupt all work at midday as in all other tropical countries.

California.

On February 1st we landed at San Francisco, not greeted by charming maidens with wreaths of flowers, but faced by the terrible infliction of a United States custom house. If I tell of our experiences there no one will ever venture in our footsteps. But all the same a most cordial intimation had been conveyed to our steamer two days before, while still in mid-ocean, that we were, all the hundreds of travellers, invited to a long drive round the town and to a review in the Presidio, the Government grounds. The San Franciscans are justly proud of their magnificent town, situated like ancient Rome, on numerous hills, and resuscitated in a marvellous, incredible manner after the earthquake and conflagration, that almost ruined it only six years ago. There is not a trace left of the havoc, and the town, with its fair white buildings surrounded by evergreen trees and nestling against its background of the mountain chain, is indescribably beautiful. As you know, it lies on a peninsula almost surrounded by water, and the town includes that celebrated Golden Gate Park which itself measures four square miles. Very different are these American parks to the European ones. The very fact of their being, like all the private gardens, quite unenclosed, open to the public, differs so much from ours; but we also noticed how much these large parks were left in their natural state. The paths and drives were well kept and tidy, and some small patches were given up to flower beds, rose or Japanese gardens, but miles were left in a wild and quite natural state. In that beautiful climate we scarcely noticed that it was mid-winter, and here and there a few trees were bare of foliage; the "live" oaks, eucalyptus, and every kind of firs wreathed the town in vivid green, and there were long avenues of mimosa and pepper trees, in such profusion of flowers that their delicate feathery leaves were eclipsed.

We found the Californians very different from the Americans of the Eastern States; a tall, fine race, tanned and southerly-looking and the traces of their ancient Spanish civilization brought from Mexico into these States, were unmistakable and had greatly influenced their architecture. We found this still more the case as we wandered southwards along the coast, which reminded us so much of the Italian Riviera.

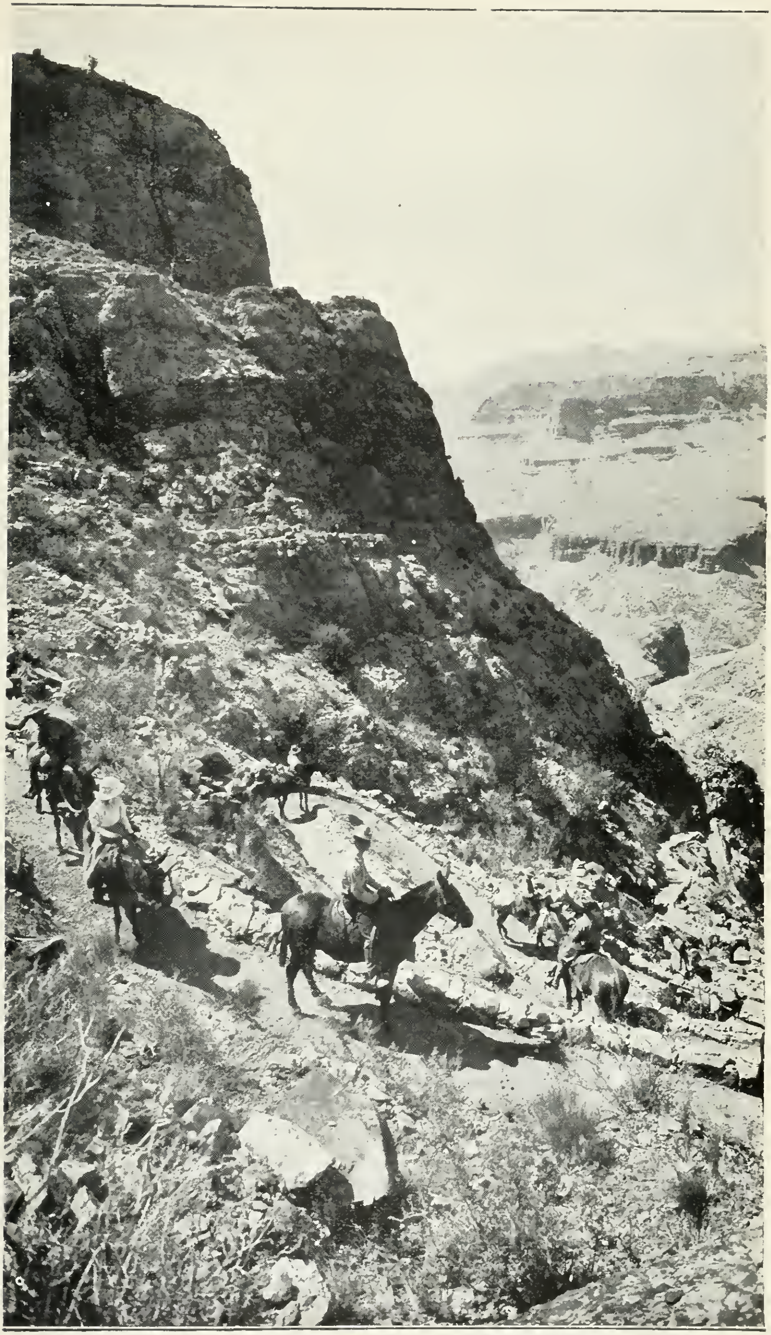

Fig. 4. Grand Cañyon. Hermit Trail, Cathedral Stairs.

The climate and vegetation are so similar, also the hotels and the exorbitant prices therein.

The millionaires of New York, Chicago and Pittsburg flock in increasing numbers to these enchanting beauty-spots, escaping thus the rigorous winter, and they build their own villas in the suburbs of the seaside towns. I wish I could give you glimpses and descriptions of these beauty spots. Monterey, where Stevenson spent a happy winter; San Barbara, where the old mission reminds you irresistibly of Italian landscapes; Coronada Beach and Robles Hot Springs. But I dare say many of you have seen it all and heard enough of it.

We passed the neighbourhood of the giant trees, of which you have all seen illustrations, and at last we settled down once more in Los Angeles, the town of the future, which is bidding fair to outrival San Francisco. This part is called the Garden of America, for not only is the town beautifully situated, but no other offers such entrancing walks and excursions. Though four miles from the coast, the suburb San Pedro belongs to the town and is provided with a good tramway service. The harbour is in course of construction, and when finished, in a few years, will outrival the great natural advantages of the celebrated San Francisco Harbour, though I doubt if it can ever look quite as beautiful. The suburbs, inland, are the pride of Los Angeles. All the streets are avenues with magnificent palms and other trees; not content with these, many of the sidewalks have long, narrow flower beds, and the trunks of the palms are covered by creepers, heliotrope, geranium and roses. The soil is rich with oil-springs, and wherever they can find water for irrigation, the soil is of incredible fertility. Pasadena, the favourite suburb, is easily reached by car.

We made an excursion to the Catalina Islands, some twelve or fifteen miles away, and were reminded of a visit to the Isle of Man, as the two hours crossing in a small steamer is very like the tossing on the Irish Sea. The water in Avalon Bay is even more pellucid and transparent, and every object takes a silvery hue, like in the celebrated blue grotto of Capri. But the inventive American has boats of all sizes in this bay, the bottoms of which are made of glass, and you sit entranced by the beauties of the deep. You see rocks and caves of white rock, vegetation like trees or heather or close-cut grass, the currents swaying the broad leaves like the wind in our trees, and the fish darting in and out, glistening and flashing, and large shining shells on a ground of snow-white sand. While we sat spellbound by these wonders of the deep, a man dived from another boat, turned and twisted in the silvery-blue, and brought up some of the most exquisite shells I ever saw. This little bay was as full of life as if it were itself an aquarium; the variety of fish was astounding, and there were many sea-lions about, roaring, begging and clamouring for food, and as tame as house dogs.

GRAND CANYON OF ARIZONA.*

One month later I had the third great sensation of my memorable journey. The first impression of unsurpassable grandeur was the moonlight on the Pyramids and Sphinx in Egypt; the second was the sunrise over the highest mountain range of the Globe, the glittering peaks of the Himalayas; the third was the sight of the grand Canyon of Arizona.

We had torn ourselves away from the great, growing towns of the Golden West, San Francisco and Los Angeles, these new towns of unlimited possibilities, in their wealth of vegetation, and their background of lofty mountains. A most luxurious train carried us eastward. These American trains deserve a chapter to themselves, and spoil one for the Old World and its customs. Of course when you commit yourself to a journey, which used to take a week and was only lately reduced to four days and nights you must be sure of a certain amount of comfort, which included in our case a saloon with writing table and letter-paper, sleeping and dressing-rooms, newspapers, magazines, a barber, a shower-bath, and every now and then an hour's interruption for a walk on a platform. As we sat on the sheltered verandah of the end carriage watching the glorious sunset on the Pacific or watching the fields with their miles and miles of orange and lemon trees, someone told us the story of the railway track, which had been, some fifty or sixty years ago, the painful, hard way the first settlers had come to California; starving, dying of thirst in the endless stretches, their babies' graves scattered over the trail.

We climbed the mountain chain, losing sight of the ocean, on to a high plateau, level except for curious table-shaped mounds rising here and there out of a boundless, arid desert, stretching as far as the eye could reach. Very few plantations interrupted the view, which would have been desolate but for

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* We are indebted to the Atchison, Topeka and Santa Fe Railway Co. for the six illustrations of the Canyon.

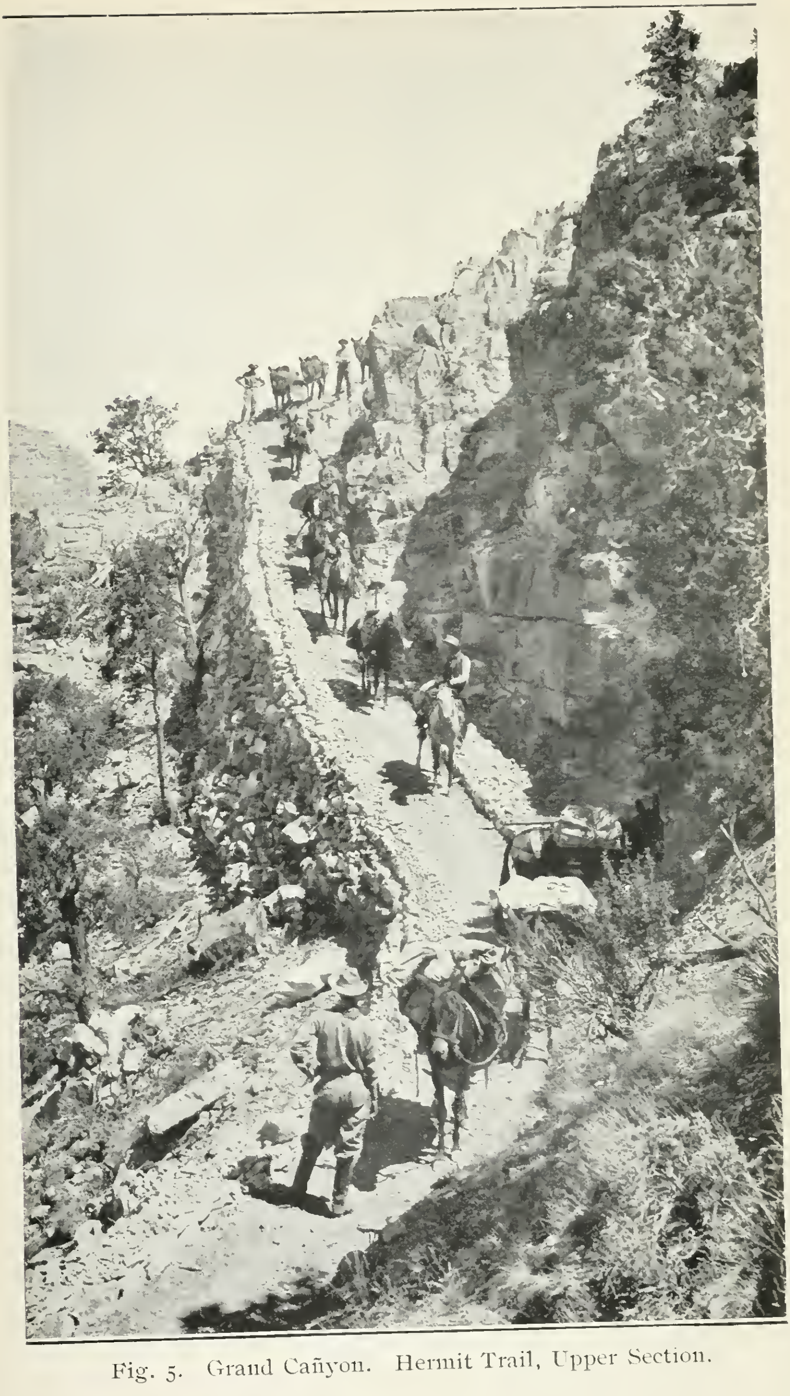

Fig. 5. Grand Cañyon. Hermit Trail, Upper Section.

the bright hot winter sun. At the infrequent stations we saw Red Indians, poor undersized folk, a mockery, for us who had devoured Cooper's memorable Leather-Stocking and Mohican tales. Occasionally a grove of fir and spruce sheltered a small station, and at such a one, after 36 hours' drive, we reach our goal. We saw an American monster hotel, all built of wood, on a slight eminence before us, and ascended leisurely and slowly. It was bitterly cold in the slanting rays of the evening sun, all vegetation being reduced to firs and shrub, for once more, as in Darjeeling, we were some 7,000 feet above the level of the sea. In the picturesque hall a roaring log fire greeted us. We left it to warm ourselves with a walk, and stepped out upon the verandah when we saw the incredible wonderful sight of the great canyon. If I could only find words to set the picture before you! The great level plain we had traversed for hours lay still before and around us, but at our very feet, steep enough to turn us dizzy, there opened this enormous chasm, this blood-red gash in mother earth. Down it went to the depth of 5,000 feet, and across they told us that it measured 15 miles, though the intense clearness of the desert and mountain air made it appear much narrower. You could not see straight down to the River Colorado that had made its bed at the bottom of this appalling precipice; here and there you could get a glimpse of its turbulent waters, which took a tortuous course through some 23 miles of the canyon. This valley is a mountain range in itself, higher by thousands of feet than any in England and Wales, and the mountains rising thus in this deep cleft are not gently rounded, covered with woods, but are sharp peaks and threatening needles, and, by the nature of their composition, shaded from black granite to deep-red sandstone in all shades of purple and maroon. As we gazed on the fantastic and weird formation of peak and range, we seemed to see once more all the wonders of our former experience; there were Egyptian pyramids and rock temples, turrets and battlements of Saracenic masonry. Buddhist temples on pillars of elephantine dimensions, pagodas and Chinese buildings of never-ending variety. Slowly the sun set and violet shadows crept up and hid the fascinating view.

Next morning I was up betimes to see the wonderful spectacle of the sunrise on this strangest imaginable landscape. We read the thrilling story of its discovery and saw the battered wreck of a steel rowing boat, in which the discoverer had made the perilous journey, deserted by his cowardly crew, in deadly peril not only from storm and shipwreck, hunger and frost, but also from the savage Indian tribes, the stronghold of whom it had been to our time.

The Indians were the first guides down the two or three trails or paths which lead down to the inferno which a Dante might have imagined in his poetic frenzy. One of these is called the Bright Angel Trail, and led down close to the fine hotel at which we stayed. A number of young and energetic travellers went down early every morning, partly on foot, partly by sure-footed ponies. We felt too old to risk a descent and a re-ascent of fully five miles, and just attempted a little half-mile promenade. Well, we had done a little mild mountaineering in the Alps in our younger days, but the Bright Angel Trail surpassed it. A very narrow path zigzagged down the face of the precipice impossible to see beyond the next turning. The night's frost had hardened the slight coating of ice that was covered in its turn by loose earth and made the path treacherously slippery, we were very glad to turn back after half an hour and to regain the plateau above. Our evening was spent in the Hopi House, for this is an Indian reservation, and the poor remnants of the proudest Indian races did some strange dancing for us and were glad to pick up the coppers we threw to them.

SUPPLEMENTARY NOTE.

Hermit Trail, Grand Canyon.

A new pathway down the south wall of the Grand Cañyon, named Hermit Trail, is being built by the Railway Company, who have kindly lent the blocks. The Trail will be four feet wide with a protecting wall on the outside. The descent is accomplished by a series of easy grades. This is the only trail with a southern aspect for the first thousand feet from the top, and, therefore, will be comparatively free from cold winds and snow.

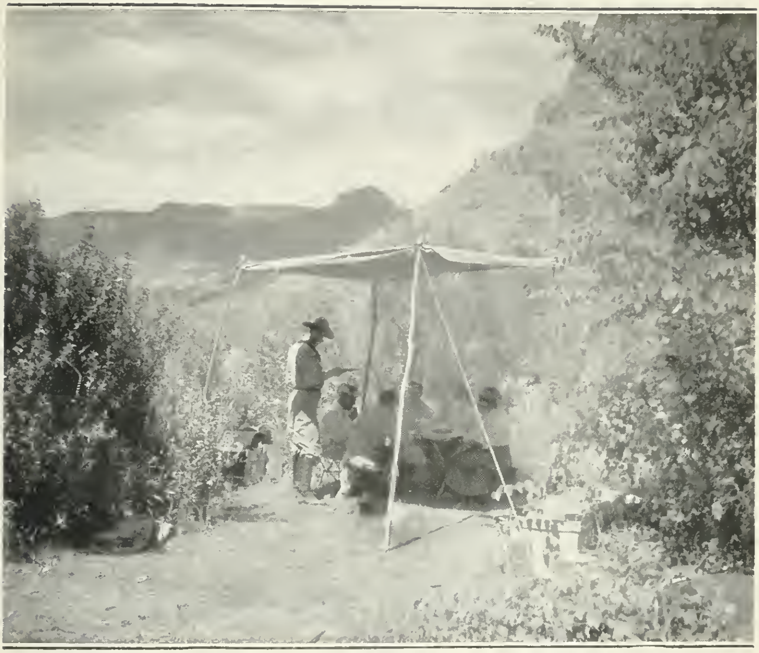

Fig. 6. Grand Cañyon. In Camp at Indian Garden.

"PERSIA."

By W. Leonard Flinn.

(Addressed to the Society in the Geographical Hall, on Tuesday, December 10th, 1912.)

It is now more than three years since I returned from my last visit to Persia, and since that time the country has gone through an eventful period in its history. Mohamed Ali Shah has been deposed and banished. He returned again, through connivance, if not of the Russian Government itself, at any rate through that of its agents and officials; but the Persians, under the leadership of Ephraim Khan, who has since been killed in battle, were able to force him to withdraw again from Persian soil. Rumours have been again current that he intends to make another descent on Persia. His brother, the Salar i Dowleh, has two or three times occupied Kermanshah, but his advances towards the capital have hitherto been repulsed. He passed close to Teheran lately with a few followers and has reached the Caspian safely. Mr. Morgan Shuster, the American, was appointed Treasurer-General, and seemed to be evolving order out of chaos, but by his uncompromising attitude on certain questions wherein he was legally and morally, but not diplomatically, in the right, he offended Russian susceptibilities, always very tender where Persia is concerned, and so he had to leave the country in accordance with Russia's ultimatum to Persia.

It would take too long to give you a comprehensive idea of the struggles between the contending factions in the whole country; suffice it to say that at present the state of things is about as bad as it can be, for the unruly tribes which have their dwellings principally in the southern and western portions of the country, are, not unnaturally, taking advantage of the lack of a strong central government to rob and pillage to their hearts' content. The most prominent of these tribes at the present day are the Bakhtiari, who practically control the Government, such as it is, and who took the chief part in deposing the ex-Shah. (The lecturer then proceeded to show, with the aid of the map, the principal trade routes and spheres of influence of Russia and England, and the salient geographical features of the country.) No account of Persia would be complete without a reference to the remarkable deserts which occupy the greater portion of the eastern half of the country. The northern desert which lies south of the road from Teheran to Meshed is perhaps the most utterly waste place on the earth. It averages two to three hundred miles from east to west and ninety to one hundred and thirty from north to south. Not a blade of grass, not even a stone, is to be seen on this level waste of mud and salt. The only objects which meet the eye on the only two precarious tracks by which it is possible to cross this dead plain are the skeletons of camels, which are so numerous as to preclude the possibility of losing one's way.

A resumé of the comparatively well-known history of Persia has already appeared in the Geographical Society's *Journal* (see Vol. XXVII, page 21), but the rich and varied literature of the country is almost unknown here, barring the Rubaiyat of Omar Khayyam. The fame of this poem is partly due to the admirable English version; but the Persians do not consider the author to be of the first rank. Firdusi, the writer of the Shahnameh, or Book of Kings, is their great epic poet (you will find it mentioned in Lord Avebury's list of 100 best books) and Hafiz and Saadi are their greatest lyrical poets. Saadi was quite a humourist at times, as the following extract from the Gulistan, his best known poem, will show:—

> There was once a famous soothsayer and astrologist, who was famed for his clever predictions and fortune telling. He returned home suddenly one day to find a strange man talking to his wife. He fell into a great rage, and struck the man, whereat great misfortune and calamity ensued. A wit who heard of it remarked:
>
> "What could he know of sky and stars or Heaven's all hidden life
> Who did not see in his own house the knave who kissed his wife?"

We will approach the capital by the usual route, *i.e.*, viâ Russia and the Caspian. The Persian port is Enzeli, and steamers now ply between it and Baku in 18 hours. Here a vast lagoon called the Murdab, lit., dead water, is connected with the sea by a comparatively narrow channel which divides the town of Enzeli. If you do not go by the mail steamer then calls are made at Lenkoran and Astara. It is, however, impossible to get close to the shore at these places, and goods and passengers are taken off in lighters, some of which, especially those in the Enzeli lagoon, are quite picturesque. From Enzeli a drive of about 25 miles brings us to Resht, the most important Persian town on the Caspian littoral, and the centre of the silk industry. Silkworms, as you know, are fed on mulberry leaves, and this tree flourishes in this part of Persia, and is indeed common over the whole country. Rice is also an important product here, and the road between Enzeli and Resht is bordered for a great part of the way by rice fields. Resht and Enzeli are both rather miserable places, and are in no way typical of Persia proper. Apart from the mud and rain which generally abound, the first part of the journey to Teheran is picturesque enough, lying as it does in the well-wooded valley of the Sefid Rud (White River). Every now and then there are clumps of olive trees, especially at Rudbar and further on at Mendgil. At the latter place we cross the river by a girder bridge (made in Russia), and leave the forest region behind us. After this the road mounts steadily through an ever-narrowing valley, until at last we reach the table-land which forms Persia proper, and which reaches now in all directions except the one from which we have just come. Kazvin, an ancient capital, one amongst many, is the first town we reach 140 miles from the coast, and from here we strike due east to Teheran, 90 miles away. The Kazvinis are not loved by other Persians, as the following saying shows:—

"Mar u Kazvini chu bini märd i bush
Marra bagzar u Kazvini bikush."

Oh, wise man, if you see a snake and a Kazvini,
Leave the snake and kill the Kazvini.

The road is good and fairly level, and the journey takes from 15 to 18 hours. We enter Teheran by the Kazvin Gate. The town is surrounded by an earthwork and a moat, mostly dry, and there are, I think, eight gates, which are closed after dark. It is a comparatively modern town; in the thirteenth century it is mentioned for the first time by an Arab historian, who says it was a mean village where the inhabitants lived in underground hovels. There is plenty of European society in Teheran, owing to the presence of the Legations, the

Indo-European telegraphs and the Imperial Bank (a British concern). The summer quarters are not far from the town, varying from seven to twelve miles off, but otherwise Teheran is not in itself a very interesting place for the traveller. The most imposing building in the European quarter is the British Legation. The Imperial Bank, with branches in nearly every town in Persia is situated at one end of the Tup Maidan, or Gun Square, which is adorned with old cannons captured from the Portuguese. The town residence of the Shah and the Court is the Shems ul Imaret, a modern structure of no particular interest. The mural painting at the top is the national coat of arms, a lion brandishing a sword in his front paw, and the rising sun peeping over his back. The alabaster throne in one of the rooms is a fine piece of work. In another quarter of the town is the Sipeh Salar mosque, close to which were the houses of Parliament, now in ruins since they were bombarded by Mohamed Ali Shah. The Parliament is at present in abeyance. I do not know where it could meet now, as they have not even a public hall in Teheran. The Cabinet, which, of course, included Mr. Shuster, also met in the Parliament House. Mr. Shuster had great difficulty in getting the taxes paid by the Persian grandees, most of whom at one time or another were in the Cabinet. One of these, Ferman Ferma, had consistently refused to pay up; so that Mr. Shuster finally threatened to confiscate his wheat granaries. Thereupon the Ferman Ferma made an eloquent speech to the Cabinet, elaborating his services to the Constitution as a commander of the troops and as Minister of War, and finished by falling on the Prime Minister's neck dissolved in tears. The other members were so touched that they wrote a letter to Mr. Shuster instructing him not to proceed with the collection of taxes from the Ferman Ferma until they had had time to investigate the matter and the Ferman Ferma presented the note in person. Mr. Shuster informed him politely that he could either pay his taxes the next day or he (Mr. Shuster) would confiscate his wheat. He then requested the other members of the Cabinet to kindly get on with the rest of the Government, and he would continue to collect the taxes. The Ferman Ferma paid up the next day.

The Sabseh Maidan is a small square, near the main bazaar, and the vehicles dignified by the name of trams have a terminus there. Another feature of the town are the Dervishes, whose favourite rendezvous is by the walls of the British Legation.

However, we must not linger in Teheran, the towns we have to visit are a long way off, and our means of transport is only a carriage. True, it is drawn by four horses, which are changed at every stage, say, 15 to 20 miles; but I expect the S.P.C.A. would have something to say if you used those scraggy, broken-kneed beasts over here. There is a road to the south, of course, and in good weather, barring a few short stretches, it is decent enough, but in winter, the wretched horses have a very bad time, and you often have to walk and even push behind sometimes. Occasionally a wheel comes off, quite often one breaks. Sometimes you find, on finishing a stage, that your baggage has fallen off the little platform constructed on the back axle. The horses even bolt sometimes (downhill of course), and I have known the driver to fall asleep on the box and subsequently fall off. Often you arrive at a stage only to find there are no fresh horses, and you have to give the old lot a rest and then go on with them again. If you have a good deal of luggage with you and are not in a hurry, then you travel caravan. This does not mean that you hire a yellow van and crawl about the country in it. A caravan is simply a train of pack animals, whether they be donkeys, mules, horses or camels. This is the true way to see the country and the least fatiguing. You can ride your own horse and can average from 20 to 25 miles a day and get plenty of shooting to fill in your spare time. In the very hot weather you often travel at night, but usually you start about dawn or, as the Persians say mian i gurg u mish: between the wolf and the sheep.

Well, we leave Teheran by the Shah Abdul Azim gate, and near Shah Abdul Azim, a well known shrine, we pass the ruins of Rhages or Rei, one of the most ancient places in Persia, about which very little is known. Rei is the Rhages of Parthia, also the Rages of the Apocrypha, to which Tobias travelled from Nineveh, guided by the angel Raphael, to recover the talents deposited with Jabael by his father. Indeed the Book of Tobit has traces of Zoroastrian influences; for instance, the dog is mentioned in quite a kind way, whereas the Jews held it to be a most unclean animal. This book is generally supposed to have been written in the second century B.C., when Rei was a great city; a great antiquity can therefore be justly claimed for the latter. It is also mentioned in the inscriptions of Darius.

The scenery is desolate, and there is nothing to interest a traveller much until we get a view of the great salt lake near the stage called Kushk i Nözerat (the only place for many miles where good sweet water is obtainable), where the road runs in an absolutely straight line for twelve miles. You can see the whole stretch at once, for it descends to about half-way and then rises gradually. At last, 70 miles or so from Teheran, we see the glittering dome of the great mosque of Kum, the shrine of Fatima. We do not go through the town itself to get to Sultanabad and turn off south-west along the river. Further on we suddenly dip into a little river valley to the stage of Selafchegan. The most part of the road has of late years been infested by robbers, but although I have been over it five times altogether I have been lucky enough to get through unmolested. The biggest village between Kum and Sultanabad is that of Ibrahimabad, beyond which can be seen another salt lake, with a circumference of about 40 miles. We pass right through Sultanabad on our way to Hamadan, changing horses at the posting-house. There is a shorter way to Hamadan than the ordinary post route, but it is impracticable for carriages, as it involves the ascent of the Dermend Pass.

Hamadan is 100 miles from Sultanabad, and the nearest place where there are any Europeans. It is a large market for all kinds of goods, and carpet weaving is an extensive industry in the adjoining villages (see Vol. XXVII, pp. 26–27). Sultanabad, however, is the great centre of the carpet production, so we will return to Sultanabad for the carpets and then pass still further on to Ispahan, 175 miles south-west of Sultanabad.

We leave Hamadan, travel over the same road again to Sultanabad, and throw ourselves on the British Vice-Consul's neck—figuratively speaking, of course. This gentleman is also engaged in trade, as the manager of an English firm which produces carpets. The second time I came here it was winter, and the snow covered everything to the depth of two feet. We had a small ornamental lake in the garden where we kept our ducks, and very frequently in winter wild ducks would come in the early morning to feed, so we were able to replenish our larder with very little effort. Just outside the walls runs a little river, which has very little water during most of the year, but in spring it often becomes quite formidable. European plants and flowers grow well here, also many kinds of fruit trees and grapes.

The carpets are woven in the weavers' own houses, but they are often supplied with the designs and dyed wool by the merchant. The wool is dyed on the premises much in the same way that it is here, although, of course, the materials are more primitive in a land where the cost of transport is so enormous. The fuel used for the heating of the vats is a very small rose-bush, indigenous to Persia, called the Rosa Persica, and by the natives Varek, and grows in great profusion in the otherwise desert plains of Central Persia. It is only a few inches high, and has a small yellow flower, with a dull red centre. After being dyed the wool has to be washed, a somewhat laborious process. The weavers, or rather their husbands, for the carpets are chiefly woven by women, come in person for their wool and carry it away on donkeys. The houses in the town and in the villages are built mostly of bricks made of mud and straw dried in the sun and plastered over with the same material; but the better class houses are constructed of bricks made in a kiln in the usual way. When the carpets are delivered they are packed into bales and carried by camels to Enzeli on the Caspian. The biggest, finest-looking camel is generally put at the head of the caravan. Of course, if a camel breaks its leg, or falls by the way, as sometimes happens, it stays where it falls and the vultures soon dispose of it. No doubt this is the ultimate fate of most of the camels.

The Dervish is always with us wherever we go in Persia, generally making his home near the gate of some well-to-do person who then has to pay him to go away. From the top of our gateway I witnessed the annual Moharrem procession, a day of mourning for the saints of the Shiite faith, who fell in the Battle of Kerbela. One portion of the procession consists of riders, each, if possible, leading an extra horse, another of men wearing long white smocks and carrying swords, with which they gash their heads. The blood, of course, runs all over their white smocks and shows how pious they are. Behind them there are generally men with sticks to keep them from doing any serious harm to themselves. Many of the weavers live in villages many miles away from Sultanabad. There are about 120 villages in a radius of 45 miles from Sultanabad, so that the work of inspection is quite an undertaking. It is advisable to have your servants armed, for disputes are sure to arise, and not infrequently end in blows. The Persian is a downy bird, and is a pastmaster in the gentle art of lying and cheating. Persia is often called the land of the Lion and the Sun (from its national emblem or crest), but the land of Liars and the Sun would be more accurate. But often he lies to be agreeable to you; for instance, if you meet a man by the way and ask him how far it is to such a place, he will say four miles, though it may be seven or eight, just to cheer you up as it were. On the other hand, if he wants you to break your journey at his house (for which, of course, he will expect to receive a present of money) he will tell you that the distance is twelve miles, and that the road is bad. And in business, if he does tell the truth it is probably with ulterior motives. To quote one of their favourite poets Saádi: "Falsehood, mixed with good intentions, is preferable to truth, tending to excite strife." Or as Professor Browne said of one of his Persian friends, he regarded lying in itself as an artistic and pleasurable exercise of the imagination, in which when there was no reason to the contrary he might fairly allow himself to indulge. However, he is not a bad fellow on the whole, and as a rule easy to get on with. If we follow the course of the little river upwards for two or three hours from Sultanabad we come to the curious village of Dinekabut. It is a sort of double village, the two parts being two or three hundred yards apart. An hour away from here we can leave our horses for an ascent of the Sefid Khaneh, a very fine mountain, especially when the snow is lying. There are frequent avalanches in spring, and the snow never quite disappears till August. Even then in some years the snow holds out till the following winter. Game abounds in these mountains, mouflon, a wild sheep, being fairly common. The wild goat or ibex is another common inhabitant of the mountains, and in the wilder regions bears are to be met with, also leopards. Wolves are common everywhere in winter, and in summer gazelles are to be met with in the plains. The lion, which has no mane and is really quite a small kind, is not to be seen near the haunts of men, and I personally have never seen one. Jackals are also very common; you can hear them howling outside almost any town in Persia. The Persians have a curious story about the jackals. Once upon a time, they say, the jackals lived inside the towns and the dogs lived in the desert. The dogs, however, got very tired of their life in the wastes and consulted together how to oust the jackals from their comfortable quarters. They sent one of their number to interview the jackals, saying that several of them were sick and needed a change of air. They proposed that, as the two races could not live peaceably together, an exchange should be effected and that the dogs should spend three days in town and the jackals go out into the desert. The change of air would doubtless prove beneficial to the jackals also, and at the end of the three days they would all return to their own quarters. To this the jackals consented, and the dogs duly took up their abode in the town. When the prescribed period was over, however, the dogs refused to leave the town and have lived in the towns ever since. And now after sunset the jackals wander round the walls of the towns with their curious whine, crying: "Nakhoshi shuma khob nashudeh-eh-eh." (Are your sick ones not well yet?) And the dogs, being Sunnis, reply in Turkish: "Yokh, yokh." (No, no.)

The villages are usually the property of some wealthy Persian; I met one of them, who engaged in looting, blood feuds and other interesting pastimes of that description. He was eventually murdered by his servants one night.

At a miserable place where I had to spend two nights on account of a blizzard, I secured some interesting Parthian coins, which were dug up in the vicinity. The village of Sahneh is a pleasanter spot, some 30 miles from Sultanabad, and a good centre for big game. A little garden near affords a pleasant shelter for the midday halt.

We now return to Sultanabad to take the carriage again en route for Ispahan. The European community ride with us for six or seven miles, and take leave of us at a ruined tea-house. The old post road goes up to Kum and then south through Kahan to Ispahan, and very dreary it is too for a good part of the way. The Natanz mountains are the most imposing we pass, and the caravan road from Kashan to Ispahan goes through them over the Kohrud Pass, and is many miles shorter. Robbers flourish exceedingly on these southern roads, and it is absolutely necessary to have arms and guards all the way to the Gulf from Kashan. One Englishman I know had some curious experiences with his guards not long ago. These gentry in their intervals of employment are often robbers *pro tem* themselves. His guards tried to rob a passing caravan, and were very indignant when he tried to restrain them, pointing out to him that so long as they kept him from being robbed, their contract with him was fulfilled. At one village he tried to obtain guards for a dangerous pass, but only three were forthcoming. He pointed out that three were quite inadequate, for the place was known to be infested with robbers. After some further parley, the headman of the village said, "well, sahib, I will tell you the truth; as a matter of fact it is we who are the robbers of the pass, and if we want you to pass safely one guard will be quite sufficient. You need have no fear therefore, as I will send someone before you to say you are not to be molested!"

The entrance from this side of Ispahan is quite unimposing, but after a mile or two of narrow streets we emerge on to the fine avenue known as the Chehar Bagh, formerly bordered by plane trees, now nearly all cut down. The house I stayed at was at the far end of this avenue, close to the River Zendah Rud, which divides Ispahan from the Armenian town of Julfa. In the distance is to be seen the mountain called the Kuh i Sufa, and another one near by has some resemblance to the Matterhorn. The river is spanned at five points by bridges, all totally different from each other, the principal one being that leading to Julfa called by the Persians Pul i See-o-Seh Chesmeh, that is, the Bridge of 33 eyes or arches. The roadway is quite flat, and the parapets very high with little galleries running through them. Half a mile lower down is the Pul i Jubi, or Aqueduct Bridge, quite a narrow one with a small water channel crossing it, and a few hundred yards further up on the Chardju Bridge, built on a rocky ledge which crops up here. The bridge rests on big platforms of stone, with narrow openings, through which the water rushes with great force in flood time. Two miles further on is the Shahristan bridge, consisting of three high arches only; it is far away from the modern Ispahan and is little used. Between here and the present town there are acres upon acres of ruins, and Ispahan of the present day is not to be compared with the Ispahan of Shah Abbas. The river continues its course for 70 miles or so, and then loses itself in a salt swamp. Before it does so, however, there is yet another bridge in good preservation, but scarcely any Europeans have ever been there. The three which concern the inhabitants of Ispahan most are the Chardju, 33 arches, and the Marnoon Bridge. In summer time there is scarcely any water in the river, most of it having been drawn off for irrigation purposes. The Consular guard of Indian cavalry use a sandy portion of the river bed for tent-pegging and the native dyers and printers wash and dry their clothes there.

(These are mostly made in Manchester, although Ispahan is technically in the Russian sphere of influence.)

In the middle of the town is the Imperial Square or Meidan Shah, surrounded by the bazaars, chief mosques, and the Governor's palace. At each end there are two stone pillars, goalposts for polo, for polo was in ancient times, a national sport in Persia. The roofs of the mosques are covered with the blue and white tiles for which Persia is famous. Ispahan is a big distributing centre for goods, but its glory has departed since it was sacked by the Afghans in 1720. Just before this happened the Shah Sultan Hussein built himself a palace on the other side of the river beyond Julfa, and this the Afghans razed to the ground. It might be considered judgment on him for having driven out the Parsees some ten years previously. They had fortified the Kuh i Sufa, which was only a mile away from his new palace, so perhaps he was afraid of them. Portions of towers and walls are still visible on the mountain, also quite a long stretch of the old road to the fortress on the summit. It makes a pleasant picnic to ride out from Ispahan to explore the ruins and the mountain, and as we cross Shah Abbas' bridge in the evening we are almost sure to see a fine sunset.

It is a far cry from Ispahan to Tabriz, by road about 700 miles, and to get there the traveller has to retrace his route to Teheran and thence to Kazvin, whence we continue due west, instead of turning north to the Caspian. The first stage out of Kazvin is along the Hamadan road, made by the Russians, and the journey is of the usual uninteresting character, till well past Zendjan, 170 miles from Tabriz. In the distance, however, we see the huge mosque of Sultanieh, once a capital of Persia, now a mere village. Three stages beyond Zendjan, the track becomes difficult for carriages; and soon we reach the banks of the Kizil Uzen River, spanned by a dilapidated bridge. It is broken for half its breadth in the middle, and there is only just room for the carriage to pass. It used to serve as a dwelling for a colony of lepers. Here begins the Kavlan Kuh Pass. It is a fearful bit of track for carriages, and of course you have to walk up and down it, for it is all the horse can do to get the empty carriage over. The pass is dominated by a craggy mountain, on which there are remnants of a castle called Kasri Dochtar (Castle of the Maiden); at the top of it there are remains of ancient paving, something to be avoided, although it looks well at a distance. At the end of the pass there is another river to cross; it has a good bridge with no special history that I know of. Mianeh is the next halting place, and from there to near Tabriz the so-called road is vile and dangerous, up and down steep and boggy hillsides and through indescribable mud in spring and autumn. You drive along river beds and have to spend the night in tumbledown houses, infested with live stock of every description. Karachemen is more picturesque than most of the places you pass in this journey, but it is not a pleasant place to pass the night in. Even worse is Tikmadash, an absolutely wretched hole, which you have to examine carefully for vermin before you deposit your belongings. We pass a small lake swarming with waterfowl before negotiating the Shipli Pass, steep and very awkward for carriages. Tabriz is only 20 miles away, however, and there are no worse difficulties to overcome. The only further difficulty is getting through the narrow streets of the town to the European quarter. Tabriz has suffered much of late years, as you will have read in the papers. You know as well as I do how Tabriz was, let us say, pacified, and I will only remind you of the siege of the town some years ago, when it was cut off from the world for nine months on account of an incident which had a distinctly humorous touch. The Royalist troops had invested it, and the inhabitants who were holding it for the Constitution, were face to face with starvation; there was scarcely any food at all left in the town. At sunrise one morning they were very much surprised to find some large flocks of sheep in the town. The herdsmen were questioned, but all the information that could be elicited was that the sheep belonged to them, and that they had managed to evade the invading forces. Of course the sheep met with a ready sale at a high price. It subsequently transpired that some of the irregular horsemen attached to the invading force had looted several villages near the town and had then driven the captured sheep to the beleaguered city in order to profit by the enormous prices obtainable for them there. Having done their little bit of business they proceeded with the siege of the town.

Tabriz is an extensive town, surrounded by miles of gardens, for a large export trade is done in raisins, almonds and dried fruits. It is not as fine a town as, for instance, Ispahan, for it has more than once been destroyed by earthquakes. The ancient citadel was still standing when last I visited Tabriz; it must have been a fine stronghold at one time, for the walls are several feet in thickness. You get a splendid bird's eye view of the town from the top. The only other place of great interest in Tabriz is the Blue Mosque, now, of course, in ruins, but you can see from the remains what a very fine building it must have been, for it was encrusted all over with the lovely blue tiles which are still to be seen in the doorway.

Well, we have got back close to the Russian frontier, and must now leave Persia. Eighty miles still separate us from the railway, and Märand, if we drive, is the last place we stop at in Persia. I only hope it will be still in Persia next time I go there, and that the country which has lately passed through such troublous times may yet attain at least a semblance of its former greatness.

Proceedings of the Society.*

July 1st to December 31st, 1912.

The 910th Meeting of the Society was held on Tuesday, October 1st, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meeting held on April 2nd were taken as read.

The election of the following new members was announced:—Ordinary: Mrs. S. F. Guthrie, Messrs. W. S. Buckley, J. H. Evans, Robert Hall, J.P., John G. Scott, S. Walker, and W. D. Woods. Associate: Miss T. G. Byrne.

The Chairman reported that letters of condolence had been sent, by direction of the Council, to the relatives of the following deceased members:—Mr. Noah Kolp, Alderman Sir Bosdin T. Leech, J.P., Mr. R. Cobden Phillips, Messrs. G. T. Cook, J. Kullmann, J. Hall, J.P., Thomas Pearson, H. Lloyd Price, F.S.A.A., and Daniel Sharrocks, J.P. The first three were members of the Council, and Messrs. Kolp and Kullmann were original Members.

The Chairman referred to the valuable services to the Society of the Vice-Chairman, who had taken the Houldsworth Hall for the three lectures in November and had arranged to have the lectures illustrated with his powerful lantern. Mr. Zimmern appealed to the members to help in filling the Hall.

Mr. T. A. Edwards, F.R.G.S., gave a lecture on "East Africa; from Durban to the Great Lake," illustrating his address with a large number of original lantern views.

EAST AFRICA; FROM DURBAN TO THE GREAT LAKE.

The lecturer said:—There is a glamour about the very name of the East, which conjures up in our minds scenes of romantic beauty,—which suggests old effete civilisations,—mystic rites and ceremonies, graceful temples, groves of palm trees, majestic rivers and impenetrable forests. When we speak of the East we usually refer to India, or even to the more remote East,—but, to-night I am going to try and give you an impression of the Eastern shores of the great continent of Africa. The same glamour which attaches to the real East is just as strongly felt when we consider that vast tract of land stretching from Durban in the South to Cape Gardafui in the North, much of which is as a book only partially opened. A page here and there has been cut and examined but the greater part of the work is as yet unknown to the nations of Europe who hold its destiny in their keeping. I have never been to India but

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* The Meetings are held in the Geographical Hall, unless otherwise stated.

I have an idea that the same "atmosphere" which pervades that Empire has also found its way into the life and customs of Eastern Africa. This is probably accounted for by the fact, that many Indians have migrated westward and taken up their abode on Afric's shore.

At one time it was thought East Africa would make a fine outlet for India's surplus population, indeed thousands of Indian coolies were imported like goods and chattels, because they were necessary (or so people thought) to the life and well-being of the Colonists. They were employed as servants, or as labourers on the Sugar and Tea Plantations or as navvies on the great public works, they were employed in fact to do any work which the Kaffir would not, or which the white man could not do. It was found that when their period of indentured labour was ended they would not continue this work, and had become so rooted in the country that they did not want to go back to India, but preferred to stay and start in some modest way of business. Now, because they can stand the climate better than the white man and exist on an income upon which the European would starve, we are told that their competition with the white man is unfair; so to-day those people who made fortunes out of the indentured labour of the coolie in times past are in many cases in the forefront of the agitation which is on foot for his suppression.

Apart from these coolie traders of modern times, there are, and have been for centuries past, Indian traders of a much better class all along the East Coast—men of broad views, men of means,—the aristocracy of commerce between the East African ports, Mauritius, Aden, and the East.

Then there is the old Arab civilisation whose beginning is lost in antiquity, the remains of which are most apparent, north of Dar-es-salaam and especially at Lamu. The Arabs were for a long time engaged in the slave trade between Zanzibar and America and have left an indelible mark on the population along the Coast. Their advent caused the genesis of a new race of people. The original Arab settlers who never dared penetrate to the interior, inter-married with the Native Bantu tribes, the result being the race of people known to-day as Swahili, meaning littorals or dwellers on the Coast. After the first blending of Arab and Native blood, this race (with some few exceptions) has kept itself fairly intact until the present day, when we find a distinct race with a distinct language. Generally speaking they are a great advance on the Kaffir tribes from which they sprung, more intelligent and more amenable to civilisation, their language is a corrupt form of Arabic and Bantu, it has become the *lingua franca* of the East Coast from Beira to the North, and is commonly used as a means of communication by European settlers of different nationalities who do not speak each other's mother tongue.

I cannot in the space of a lecture deal with all these questions fully, my object to-night is simply to give you my impressions of

East Africa which these few introductory remarks, with the assistance of my photographs, may serve to elucidate.

There are two ways of getting to East Africa to-day, the short way through the Suez Canal and the western route round South Africa.

I will to-night conduct you in imagination via this latter route, as discovered by Vasco da Gama in 1497 when South Africa was first circumnavigated. You will remember that de Diaz sighted the Cape in 1487 but never succeeded in rounding it, and from the storms he encountered and the buffeting his vessel got, he named it the "Cape of Torments." Ten years later, on November 20th, 1497, Vasco da Gama sailed round it and re-named it the "Cape of Good Hope," because it gave him every hope of discovering a sea passage to the East Indies.

The lecturer then showed a view of the Bay of Vera Cruz, at Teneriffe, which took its name from the planting of the Holy Cross on the island by the early pioneers. A view of Table Mountain and the Rocky Coast along the extreme southern point of the Cape was, the lecturer said, one of the few views which would probably be the same to-day as it was when Vasco da Gama saw it in sailing round the Cape hundreds of years ago. The lecturer explained the difficulties of navigating the dangerous coast between the Cape of Good Hope and Durban. It took Vasco da Gama from November 20th, when he rounded the Cape, until December 25th, when he reached Durban, it was of course from the latter fact that Natal got its name. Vasco da Gama left two malefactors behind him at Durban, to make what investigations they could and take their chances of being killed off by natives. After showing views of Durban and district, including some interesting pictures taken on the South Natal line showing the type of Natives and Indian coolies working in the tea and sugar plantation, the lecturer proceeded: We next hear of Vasco da Gama at Mozambique in March, 1498, we will still follow the same route but will look in at the various ports on the East Coast between Durban and that place. The first one we come to is Delagoa Bay which is one of the finest deep sea harbours in the world, it is a Portuguese possession, but being as it is the natural port for the Transvaal it is to be hoped that some day we may be able to acquire it from the Portuguese. It would make a vast difference to the developments both of the Eastern Transvaal and of Portuguese East Africa itself if the harbour of Delagoa Bay and the country immediately behind it could be administered on British lines.

Photographs were then shown of the Bay and the town of Lourenzo Marquez, also many views of the Hinterland.

The lecturer then continued a description of the Coast journey showing views of Beira, which he described as a town built on a sand bank.

Views were shown of the Pungwe River, the mouth of which forms the harbour of Beira and which the lecturer explained, in the wet season overflows its banks for about forty miles turning huge tracts of land into reeking swamps.

After passing Chinde, situated at the entrance to the Zambezi River, the lecturer next referred to Mozambique. Some of the photographs he showed illustrated one of the original forts and the old defences of the town, now used as a prison. Still in Portuguese territory, the lecturer gave a description of the island of Ibo, one of the photographs being that of the principal street, which at the time the lecturer was there had just been re-christened "Republic Street."

Leaving Portuguese territory behind, views were shown in German East Africa of Dar-es-salaam and its land-locked harbour, also its main street with a beautiful avenue of acacia trees. Other views included Tanga Harbour and Market Place, also that of a Baobab tree, about 16 feet in diameter. After giving views of Zanzibar which included a group of black soldiers attached to the King's African Rifles enjoying a game of cards, and some Indian Civil servants playing cricket, the lecturer brought his audience to Mombasa, the real starting point for the Great Lake; and continued his lecture as follows:—

When Vasco da Gama arrived here in 1498 he found houses very like those he would be familiar with in his own country and in Spain. The place was in the occupation of the Arabs but later, in 1507, Dom Francesca D'Almeida who had left Lisbon in April and arrived in Mombasa with twenty-two ships, took the place from the Arabs and the Portuguese held it for a considerable time.

Having shown a view of the High Court of Justice the lecturer showed two views of the Prison, referring to this, he said, "by a natural transition from the High Courts of Justice we come to the Prison, which was formerly a Portuguese fort, built in 1593. It was taken by the Arabs in 1698 after a most sanguinary siege lasting for three years, later on the Portuguese won it back, only to be re-taken by the Arabs who held it until the British finally took possession."

After showing pictures illustrating the Coronation Festivities in Mombasa including the Cathedral, Native village, and a body of Iskaris or native British soldiers, the lecturer said: During the latter half of the 19th century that portion of East Africa which we now know as British East Africa was torn by internecine warfare and was a prey to the dreaded slave raiders. The British Government granted a Charter to the British Imperial East Africa Company in 1888 and finally took over the territory, forming a British Protectorate, in 1895. From that time Mombasa has increased in importance as the head of the great railway which was started in 1896 and completed after many struggles, in face of all difficulties, but only with much loss of life and chiefly with the aid of Indian labour in 1902. This railway, known as the Uganda Railway, covers some of the wildest country and overcomes some of the most difficult engineering problems to be met with anywhere in Africa; although it never reaches Uganda it quite justifies its name as it couples up the harbour of Kilindini on the coast with Port Florence on Victoria Nyansa, from which point access to Uganda is rendered both easy and pleasant by means of the well-equipped steamers which make regular journeys across the Lake.

The lecturer then showed photographs of various views along the line including Nairobi, the chief town in East Africa, which is the centre from which most of the big game expeditions set out. Another view was that of Lake Naivaisha with a large herd of zebras in the distance, also of Lamoru, the highest railway station in Africa, 7,340 feet above the sea level, shortly after which the lecturer explained how the railway line crosses the summit, which is higher than the heights Ben Nèvis and Snowdon combined. Further views were shown of forest, viaducts and curves on the railway, illustrating the difficulties the engineers had to encounter in the construction of the line.

A great variety of views were shown of the Kisumu district including Port Florence on Victoria Nyanza. Scenes on the Government experimental farm at Kibos, as well as many pictures illustrating the life of the Kavironda Natives, whose absence of dress, the lecturer explained, made it rather difficult to illustrate to a Manchester audience. The lecturer explained that although these natives go about their daily avocations practically in a state of nature, they are amongst the most moral of all African tribes, taking the basis of morality of course from the native's point of view. The lecturer detailed at some length the steps which are being taken in this part of Africa to eradicate the terrible sleeping sickness, and spoke very highly of the great work which is being done by the British Civil servants on the spot. The point which the lecturer emphasized was, that they looked upon their duties as being not so much those of governors or administrators, but rather as acting in such a way as to make the Protectorate a real protection to the thousands of natives under their supervision, by acting towards the natives with every possible consideration, by educating and training them in their own interests so as to protect them from the devastating effects of warfare and disease.

The Chairman moved a resolution tendering the best thanks of the Meeting to the lecturer for the very interesting and instructive account which he had given of his journey. The resolution was passed unanimously.

The 911th Meeting of the Society was held on Tuesday, October 8th, 1912, at 7-30. In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meeting held on October 1st, 1912, were taken as read.

The Chairman announced the election of the following members:—Ordinary: Mr. G. R. Mellor (Life), Messrs. P. Knowles, John Lea,

T. C. Midwood, and G. H. Walker. Associate: Miss Brobson, Miss F. Lea, Miss F. Simpson, Miss M. R. Spencer, Messrs S. Spencer and I. Zellweger.

The Rt. Rev. Bishop Welldon, D.D., Dean of Manchester, gave a lecture, entitled, "Some Thoughts upon Iceland." (See page 25.) The lecture was illustrated with lantern views kindly lent by Miss Lang, Mr. E. Hare Wakefield, Mr. S. G. Rudler, and Dr. W. M. Tattersall.

The Chairman moved, and it was unanimously resolved, that the best thanks of the Meeting be given to his Reverence for the very interesting and entertaining account which he had given of his visit to Iceland.

The 912th Meeting of the Society was held on Tuesday, October 15th, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S..

The Minutes of the Meeting held on October 8th, were read and approved.

Mr. A. H. Garstang, F.R.S.L., gave a lecture on "The Canyon of the Tarn and other Natural Curiosities of Lozère." The address was illustrated with original lantern views.

The Chairman, on behalf of the Members present, thanked the Lecturer for the very interesting and instructive account which he had given of his journey, and for the fine views with which he had illustrated his lecture.

The 913th Meeting of the Society was held on Tuesday, October 22nd, 1912, at 7-30 p.m. In the Chair, Mr. George Ginger.

The Minutes of the Meeting held on October 15th were taken as read.

The election of the following Members was announced:—Ordinary: Messrs. R. Bock, C. Dyckhoff, H. Griffiths, F. M. Hertz, C. J. Hulme, Richard Janovski, Ernest Kolp, C. Kukla, R. Lederer, Will. Melland, A. Ogden, John A. Osborn, F. M. Provis, and Henry Wood. Associate: Miss Hilda Hall and Mr. Paul Fuchs.

The death of Mr. J. C. Blake was mentioned, and the Chairman intimated that a letter of sympathy had been sent by the Secretary to the relatives of Mr. Blake.

The attention of the Members was drawn to the War Map of the Balkans, presented by Messrs. Bartholomew, and more especially to the valuable series of Maps on a larger scale of European Turkey, presented by the Director of Military Operations, War Office; all of which could be seen in the Library.

Mr. M. Seifert gave a lecture on "Italy," illustrated with many good lantern views.

Synopsis.—Turin, with its votive offering, the Superga; Genoa, the birthplace of Columbus; Pisa, and its tower; Rome, ancient and modern; Tivoli, and its waterfalls; Naples, with Vesuvius and

Pompeii; Florence, with Michael Angelo's masterpieces; Venice, with its bridges; Milan, and its marvellous cathedral; and several of the most beautiful of the Italian lakes.

The Chairman moved, and it was unanimously resolved, that the best thanks of the Meeting be given to Mr. Seifert for his interesting address and for the fine views exhibited.

The 914th Meeting of the Society was held on Tuesday, October 29th, 1912, at 7-30 p.m. In the Chair, Mr. David A. Little.

The Minutes of the Meeting held on October 22nd were taken as read.

Mr. E. Hare Wakefield, of Barnsley, gave a lecture, entitled, "From the Dogger to the Dowsing."

The address was a description of the North Sea Fishing Industry and of personal experience on trawlers engaged therein, and was well illustrated with original lantern slides.

On the motion of the Chairman, it was unanimously resolved that the best thanks of the Meeting be given to Mr. Wakefield for the very interesting account which he had given of his experiences.

The 915th Meeting of the Society was held on Tuesday, November 5th, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.

The Minutes of the Meeting held on October 29th were taken as read.

The election of the following Members was announced:—Ordinary: Mrs. H. L. Lees and Miss B. Ormrod, Messrs. G. F. Berry, G. Dehn, J. Hancock, P. W. Kessler, L. F. Massey, A. Mills, J. A. Pearson, A. W. Pigott, J. Tyson Taylor, J. Alan Walker, and W. H. Whitby. Associate: Miss Alexander and Miss Stott.

Mrs. S. Simon gave a lecture, entitled, "Farthest West," being a description of a Journey from Japan to the United States, giving a full account of Hawaii, and making special reference to the Wonders of the Grand Canyon of Arizona. (See page 99.) The address was illustrated with many fine lantern views.

The Chairman moved, and it was unanimously resolved, that the best thanks of those present be given to Mrs. Simon for her very interesting account of her journey.

The 916th Meeting of the Society was held in the Houldsworth Hall, Deansgate, on Tuesday November 12th, 1912, at 7-30 p.m. In the Chair, Professor Elliott Smith, M.A., M.D., F.R.S.

Mr. F. F. Ogilvie, Hon. Secretary of the Egypt Exploration Fund, U.S.A., gave a lecture, entitled, "The Approaching Tragedy of

Philæ." The lecture was well illustrated with colour photography and other lantern views, which were shown by Mr. E. W. Mellor, J.P., F.R.G.S., with his powerful lantern.

Mr. F. Zimmern, F.R.G.S., moved, and Mr. R. Kalisch, F.R.G.S., seconded, and it was unanimously resolved that the hearty thanks of the Meeting be given to Mr. Ogilvie for the very interesting lecture, to Prof. Elliott Smith for presiding, and to Mr. E. W. Mellor for so ably illustrating the lecture.

The 917th Meeting of the Society was held in the Houldsworth Hall, Deansgate, on Tuesday, November 19th, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.

The Count Eric von Rosen had arranged to lecture on his African Journey, but owing to the serious illness of the Countess, he was unable to leave Sweden.

Mr. Harry K. Eustace gave a lecture, entitled, " On Safari in Equatorial Africa." The address was illustrated with original lantern slides and cinematograph films.

The Chairman moved, and it was unanimously resolved, that the hearty thanks of the Meeting be given to the lecturer for his interesting address so well illustrated.

The 918th Meeting of the Society was held in the Houldsworth Hall, Deansgate, on Tuesday, November 26th, 1912, at 7-30 p.m. In the Chair, Mr. F. Zimmern, F.R.G.S.,

Mr. E. W. Mellor, J.P., F.R.G.S., gave a vivid description of his Journey down " The White Nile from Uganda to Khartoum." (See page 61.) The lecture was illustrated with colour photography and other lantern slides, also with cinematograph views, all taken by the lecturer (or Mrs. Mellor) and shown by means of his powerful lantern.

Mr. C. A. Clarke moved and the Chairman seconded a resolution, thanking Mr. Mellor for the very interesting lecture which he had delivered, and for the splendid way in which it was illustrated. Also for his kindness in arranging for the Houldsworth Hall for the three lectures and for illustrating the previous two lectures with his fine lantern. The resolution was carried with acclamation.

The 919th Meeting of the Society was held in the Free Trade Hall, on Friday, Nov. 29th, 1912, at 7-30 p.m. In the Chair, Mr. Harry Nuttall, M.P., F.R.G.S., President of the Society.

Captain Roald Amundsen, F.R.G.S., gave a lecture, entitled, " How we reached the South Pole." (See page 83.)

Mr. Nuttall, in introducing the lecturer, said that every member of the audience would unite, with the Geographical Society, in offering to Captain Amundsen a most cordial welcome to Manchester. They had followed his career with the greatest interest, and had admired the courage and devotion which he had brought to bear on the cause of Polar exploration, culminating in his attainment of the South Pole. They regarded the pursuit of knowledge in a cosmopolitan spirit and they regarded Captain Amundsen as a great pioneer—an eminent member of the human family.

Captain Amundsen then gave his lecture, which was well illustrated with many fine lantern views and with cinematograph films, all splendidly shown by Mr. E. W. Mellor, J.P., F.R.G.S., with his powerful lantern.

At the close of the lecture, Mr. Nuttall presented Captain Amundsen with a Certificate of Honorary Membership of the Geographical Society, and Captain Nilsen, the commanding officer of the "Fram," the vessel which, as Captain Amundsen said, had been "furthest North and furthest South," came on the platform and was received with acclamation.

The Rt. Hon. the Lord Mayor, in moving a vote of thanks to the lecturer, gave him a hearty welcome to Manchester, and Mr. F. Zimmern, F.R.G.S., the Chairman of the Council of the Society, expressed the good wishes of the Society to Captain Amundsen for his next expedition, in which he will attempt to drift across the North Pole, with provision for four years. The resolution was carried with hearty applause, and in reply Captain Amundsen, after expressing his pleasure at the appreciative reception he had received and at the unique way in which the Chairman had introduced him, thanked the Society for electing him an Honorary Member

Mr. J. H. Greenhow, the Norwegian Vice-Consul; moved, and it was unanimously resolved, that the best thanks of the Meeting be given to the Chairman for his valuable services, and to Mr. E. W. Mellor, J.P., F.R.G.S., Vice-Chairman of the Council, for so splendidly showing the slides and films with his lantern.

The 920th Meeting of the Society was held on Tuesday, December 3rd, 1912, at 7-30 p.m. In the Chair, Mr. C. A. Clarke.

The Minutes of the Meetings held on November 5th, 12th, 19th, 26th, and 29th, were taken as read.

The election of the following Members was announced:—Ordinary: Dr. Edgar Grey, Messrs. C. Sutton, G. H. Sussum, and J. J. Wilde. Associate: Mr. S. Ashworth.

The Chairman referred to the loss by death of Mr. John Cocks, J.P., and all present rose in sympathy.

The Rev. W. L. Broadbent gave a lecture on "British Guiana: the El Dorado of Sir Walter Raleigh," and illustrated his remarks with many lantern slides.

The Chairman, on behalf of the Meeting, thanked the lecturer for his interesting address.

The 921st Meeting of the Society was held on Tuesday, December 10th, 1912, at 7-30 p.m. In the Chair, Mr. Richard Kalisch, F.R.G.S.

The Minutes of the Meeting held on December 3rd were taken as read.

The election of the following Ordinary Members was announced:—Messrs. T. Bourne, Charles Hahlo, G. S. Hammond, A. Knudsen, E. Pickstone, and Herbert Woodruff.

Mr. W. Leonard Flinn gave a lecture on "Persia," illustrating his remarks with a large number of interesting lantern slides. (See page 109.)

The Chairman, in proposing a vote of thanks which was passed unanimously, said that as a Geographical Society they had no politics, but Mr. Flinn, who was engaged in Commerce with that country, naturally felt strongly on one or two matters; and so was to be excused for slightly touching on controversial questions.

The 922nd Meeting of the Society was held on Tuesday, December 17th, 1912, at 7.0 p.m., and took the form of a lecture to the children of the members. Dr. Alfred Rée, Member of the Council, presided.

Mr. J. Stephenson Reid gave a lecture on a "Journey round the World," illustrating his remarks with many lantern views.

At the conclusion of the lecture, the Chairman thanked the lecturer on behalf of those present, and the children showed their appreciation by hearty applause.

The 923rd Meeting of the Society was held on Friday, December 20th, 1912, at 7-30 p.m. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

The Minutes of the Meetings held on December 10th and 17th were taken as read.

The election of Mr. John W. Allen as an Ordinary Member was announced.

Mr. J. Cardwell-Quinn, M.Sc., gave a lecture on "A Visit to the Highlands of Brazil." The address was illustrated with original and other lantern views and dealt mainly with the River San Francisco, down which Sir R. Burton made his famous canoe trip, as described in his "Highlands of Brazil." The lecturer also described the pioneer Garden City of the World, Bello-Horisonte, the new capital of the State of Minas Geraes, the first stone of which was laid only about fifteen years ago on a site where in Burton's time there were merely a few mud dwellings, finally referred to the Rubber region of the San Francisco Valley, to the various species of Manihot Rubber Tree native there, and to the future possibilities of the country.

The Chairman moved, Mr. George Ginger seconded, and it was unanimously resolved that the best thanks of the Meeting be given to the lecturer for the interesting description (so well illustrated) of his journeys.

List of Maps, Books, Journals, etc.,

ACQUIRED BY THE SOCIETY
FROM JANUARY 1st TO DECEMBER 31st, 1912.

Maps.

EUROPE.

Norway. Beretning om Norges Geografiske Opmaalings Virksomhet i Tidsrummet, 1 Juli, 1910—30 Juni, 1911. Kristiania, 1912. *Norges Geografiske Opmaaling.

Norway. Katalog over Sjökarter den 1 Januar, 1912. Kristiania, 1912 *Norges Geografiske Opmaaling.

Norway. Den Norske Kyst, 319. Scale 1/200,000. Kristiania: Norges Geografiske Opmaaling, Sjökartverket. *Norges Geografiske Opmaaling.

Norway. Topografisk kart over kongeriket Norge. L. 11 Nordfold; X. 3 Lebesby; 38C, Tonset; M8 Harstad. Maalestok, 1/100,000. Kristiania: Norges Geografiske Opmaaling, 1912. *Norges Geografiske Opmaaling.

Norway. Norges Geologische Undersökelse. Söndre Fron. Maalestok, 1/100,000. Kristiania: Norges Geografiske Opmaaling, 1911. *Norges Geografiske Opmaaling.

Norway. Den Norske Kyst, 68, 69, 77 and 87. Scale, 1/50,000. Kristiania: Norges Geografiske Opmaaling, Sjökartverket. *Norges Geografiske Opmaaling.

Political Map of the Balkan States, by J. G. Bartholomew, LL.D., F.R.G.S. Scale 1/2,000,000. Edinburgh: John Bartholomew and Co., 1912. (Price 1/- Paper and 2/- mounted on Cloth.) *The Publishers.

International Map. 1/1,000,000. Europe. North K. 35, Istambul (Constantinople). Geographical Section, General Staff. London: War Office, 1912. *The Director of Military Operations.

Carta Politica dei Paesi del Mediterraneo. Scala 1/6,750,000. Novaro: Instituto Geografico de Agostini, 1912. *The Publishers.

ASIA.

Map of China, shewing Railways, Telegraphs, and Treaty Ports. Scale 1/5,000,000. G.S., G.S. No. 2,361. London: War Office, 1912. *The Director of Military Operations.

AFRICA.

Carta Politica dell' Africa. Scala 1/24,000,000. Novaro: Instituto Geografica de Agostini, 1912. *The Publishers.

Mission Cortier. Carte de L'Aïr dressée par le Capitaine Cortier et l'Adjudant Malroux. Echelle de 1/500,000. Feuilles 1 and 2 (2 Copies). Paris: Service Géographique des Colonies, 1912. *Ministère des Colonies.

Africa. 1/250,000. Sierra Leone. Sheets: North–B–28, E and F, Sherbro; North–C–28, W and X, Ronietta; Sheet North–C–29, S, Panguma. G.S., G.S. No. 1,764. London: War Office, 1912. *The Director of Military Operations.

Africa. 1/250,000. Northern Nigeria. Sheets: North–B–32, B, Dekina; C, Abinsi; D, Kalsina Allah; North–C–31, E, Sabongari; F. Zuru; J, Dekala; P, Yashikira; North–C–32, E, Messau; F, Dura; R, Lau: North–C–33, G, Biu. G.S., G.S. No. 1,764. London: War Office, 1912. *The Director of Military Operations.

Africa. 1/250,000. Cape of Good Hope. Sheets: South–H–34, B, Schuit Drift; J, Kenhardt; P, Van Wyk's Vlei; V, Fraserburg. G.S., G.S. No. 1,764. London: War Office, 1912. *The Director of Military Operations.

Africa. 1/250,000. East Africa Protectorate. Sheets: South–A–37, B, Kenya; H, Machako's; I, Kitui; N, Makindu; O, Yatta Plateau; U, Voi. G.S., G.S. No. 1,764. London: War Office, 1912. *The Director of Military Operations.

Africa. 1/125,000. East Africa Protectorate Sheets: South–A–37, A–I, Nakuru; A–II, Nyeri; B–III, Fort Hall. G.S., G.S. No. 2,230. London: War Office, 1912. *The Director of Military Operations.

First or Assuan Cataract. Sheets A, B, C, D, E, F. Scale 1/10,000. Cairo: Survey Department Public Works Ministry, 1900. Revised 1904. *Mr. Robert Crosthwaite, M.A., B.Sc.

Mar Rosso e Possedimenti Italiani in Africa. Scala 1/4,500,000. Novaro: Instituto Geografico de Agostini, 1912. *The Publishers.

Nuova Carta della Tripolitania e Cirenaica. Scala 1/5,000,000. Con Cartine Speciali. Scala 1/2,000,000. da A. Dardano. Novaro: Instituto Geografico de Agostini, 1912. *The Publishers.

Le Nuove Province Italiane Tripolitania e Cirenaica. Scala 1/2,500,000. Con Carte speciali della Tripolitania e della Cirenaica. Scala 1/1,000,000. da Achille Dardano. Novaro: Instituto Geografico de Agostini, 1912. *The Publishers.

AMERICA.

Geologic Map of North America, compiled by the United States Geological Survey in co-operation with the Geological Survey of Canada and Instituto Geologico de Mexico. Under the supervision of Bailey Willis and George W. Stose. Scale 1/500,000. 1911. To accompany Professional Paper 71. Washington: United States Geological Survey, 1912. *The Director of the Survey.

Atlas of Canada. No. 4, Geology, West Sheet. No. 5, Geology, East Sheet. Scale 100 miles to one inch. Ottawa: Department of the Interior. *Department of Mines, Geological Survey, Canada.

Canada. 2 miles to 1 inch. Ontario-Quebec. Cornwall Sheet (2 copies). G.S., G.S. No. 2,336. London: War Office, 1911 and 1912. *The Director of Military Operations.

Canada. Department of Militia and Defence. Topographic Map. Scale 1/63,360, or 1 inch to 1 mile. Sheets: Nos. 29, Long Point; 31, Port Burwell; 32, Tillsonburg; 33, Hamilton; 34, Toronto; 35, Brampton; 39, Bothwell; 40, Sarnia; 42, St. Clair Flats; 43, Ridgetown; 45, Romney; 47, Belle River. G.S., G.S. No. 2,197. London: War Office. *The Director of Military Operations.

The Lowery Collection. A Description List of Maps of the Spanish Possessions within the present limits of the United States, 1502—1820, by Woodbury Lowery. Edited with notes by Philip Lee Phillips, F.R.G.S. Chief, Division of Maps and Charts. Washington: Library of Congress, 1912. *The Library of Congress.

Map of Wisconsin, showing Geology and Roads, by W. O. Hotchkiss and F. T. Thwaites, 1911. Scale 6 miles=1 inch. Madison: Wisconsin Geological and Natural History Survey. *The Survey.

Souvenir Model of the Panama Canal. I. L. Maduro, Jr. *Mr. G. H. Cooke.

Mappa do Estado de Minas Geraes. Organizado por ordem da Directoria da Viação, Obras Publicas e Industria Edição provisoria, 1910. Escalo 1/1,000,000. S. Paulo e Rio: Hartmann-Reichenbach. *Mr. J. Cardwell-Quinn, M.Sc.

POLAR REGIONS.

Spitzbergen. Green Habour av Isachsens Norske Spitsbergenekspedition, 1909–1910. Maalestok 1/100,000. Kristiania: Norges Geografiske Opmaaling, 1912. *Norges Geografiske Opmaaling.

ATLASES, PHOTOGRAPHS, Etc.

Calendario Atlante de Agostini, 1912. Con note geografico-statistiche de Prof. Dr. A. Machetto. Anno ix. Seconda Edizione. Novaro: Instituto Geografico de Agostini, 1912. *The Publishers.

An Atlas of Twelve Maps of India. Accompanied with Tables and Notes, by Trelawney Saunders, F.R.G.S. London: Edward Stanford, 1889. *Mr. J. C. Blake, F.R.G.S.

Petit Atlas du Congo Belge. Bruxelles: Maison D'Edition Albert de Boech. *Institut Géographique, Université Nouvelle, Bruxelles.

Twelve Chromo-Lithographs of Pompeii (Framed). *Mr. J. E. P. Scott.

A Portrait Group of the Members, prepared in Celebration of the 21st Anniversary (1905), by Messrs. Lafayette, Ltd. *The Photographers.

Portrait of Mr. John Ainsworth, C.M.G., F.R.G.S. *Mr. John Ainsworth, C.M.G., F.R.G.S.

Two Hundred and Fifty Lantern Slides of West Africa. *Mr. Wm. B. Leech.

One Hundred and Four Lantern Slides of the West Indies, Panama Canal and South America. *Mr. Wm. B. Leech.

Knife. Canary Islands. (For the Museum.) *Mr. Egbert Steinthal.

Books.

GENERAL.

A Bibliography, Guide and Index to Climate, by Alexander Ramsay, F.G.S., F.R.G.S., etc. London: W. Swan Sonnenschein and Co., 1884. *Mr. Isaac Chorlton.

The Scientific Study of Scenery, by John E. Marr, M.A., F.R.S. Diagrams and Illustrations. London: Methuen and Co., 1900. *Mr. Isaac Chorlton.

Handbook of Commercial Geography by Geo. G. Chisholm, M.A., B.Sc. (Edin.), etc. Fourth Edition. London: Longmans, Green and Co., 1903. *Mr. Isaac Chorlton.

Journal of Researches into the Natural History and Geology of the Countries visited during the Voyage of H.M.S. 'Beagle' Round the World, under the Command of Capt. FitzRoy, R.N., by Charles Darwin, M.A., F.R.S. Portrait. London: John Murray, 1890. *Mr. Isaac Chorlton.

The Geographical Teacher. The Organ of the Geographical Association. Nos. 32, 33, 34; 1912. *Mr. H. Sowerbutts, A.R.C.Sc.

The Geographical Journal, January, 1905, to January, 1912. London: Royal Geographical Society, (in continuation of former gift, see M.G.S. Journal, Vol. XXI, page 166). *Mr. A. Montefiore Brice, F.R.G.S.

The Times, May 24, 1912. Containing articles on the British Colonies. With Maps, Plans and Illustrations. *Mr. Isaac Chorlton.

The Traveller's Gazette. Illustrated. Vol. LXII; Nos. 1—12. London: Thos. Cook and Son, 1912. *The Publishers.

Lloyd-Zeitung. Organ des Norddeutschen Lloyd. Jahrgang XIII, Nos. 7—23; XIV, 1—5. Bremen, 1912. *The Publishers.

Geodaetiske Arbeider. Hefta 1. Praecisionsnivellement og Signalnivellementer, utgit of Norges Geografiske Opmaaling. Kristiania, 1912. *Norges Geografiske Opmaaling.

Whittaker's Almanack for 1912, with John Heywood's Official Lancashire Supplement.

The Co-operative Wholesale Societies, Limited, Annual, 1912. *Mr. G. H. Warren.

BRITISH ISLES.

The Year-Book of the Scientific and Learned Societies of Great Britain and Ireland. A Record of the Work done in Science, Literature and Art during the Session 1911–1912 by numerous Societies and Government Institutions. Compiled from Official Sources. Twenty-ninth Issue. London: Charles Griffin and Co., 1912.

The Incorporated Accountants' Year Book, 1912–13. *The Council of the Society of Incorporated Accountants and Auditors.

Leland's Itinerary, by William Harrison. 4 Maps. Manchester: Richard Gill, 1911. *The Author.

Romantic Essex, Pedestrian Impressions, by Reginald A. Beckett. Illustrations. London: J. M. Dent and Co., 1901. *Mr. Isaac Chorlton.

An Historic and Picturesque Guide from Clifton through the Counties of Monmouth, Glamorgan, and Brecknock, by G. W. Manby. Map and

Illustrations. Bristol: Fenley and Baylis, 1802. *Mr. George Thomas, J.P.

Motoring in the North Midlands, by Charles G. Harper. Maps and Illustrations. Issued under the Auspices of the Touring Department of the Royal Automobile Club. Cheltenham: Edward J. Burrow, 1911. *Mr. George Walker.

The Annals of Newark-upon-Trent, comprising the History, Curiosities, and Antiquities of the Borough, by Cornelius Brown. Illustrated. London: H. Sotheran and Co., 1879. *Mr. George Thomas, J.P

Haddon Hall, an Illustrated Account of the Fabric and its History, by F. H. Cheetham. Plans and Illustrations. Manchester: Sherratt and Hughes, 1904. *Mr. Isaac Chorlton.

Sixtieth Annual Report to the Council of Manchester on the Working of the Public Free Libraries, 1911–1912. *The Chief Librarian.

Manchester Field Naturalists and Archæologists' Society. Report and Proceedings for the Year 1911. *Mr. Wm. H. Ward.

Report of the Committee appointed to report upon the Carboniferous Limestone Formation of the North of England, with special reference to its Coal Resources, by Stanley Smith, M.Sc., F.G.S. Edited by the Secretary, Lawrence Austin. Maps. Newcastle-upon-Tyne: North of England Institute of Mining and Mechanical Engineers, 1912. *The Publishers.

Topographical and Statistical Description of the County of York, by G. A. Cooke. Maps and Illustrations London: Sherwood, Neeley and Jones. *Mr. George Thomas, J.P.

Yorkshire Resorts on the North-Eastern Railway. Compiled by Percy J. Piggott. Maps and Illustrations. Cheltenham: Edward J. Burrow. *The North-Eastern Railway Company.

Yorkshire (Part II). West and Part of North Ridings and all parts of the County west of the North-Eastern Main Line, also Barnard Castle and Teesdale, by M. J. Baddeley, B.A. Maps and Plans. Second Edition. London: Dulau and Co., 1893. *Mr. Isaac Chorlton.

Excavation of the Roman Forts at Castleshaw (near Delph, West Riding), by Samuel Andrew and Major William Lees, J.P. First Interim Report prepared by F. A. Bruton, M.A. Maps, Plans and Illustrations. Manchester: Sherratt and Hughes, 1908. *Mr. Isaac Chorlton.

Guide to the Durham, Northumberland and Cumberland Resorts on the North-Eastern Railway. Compiled by P. J. Piggott. Maps and Illustrations. Cheltenham: Edward J. Burrow. *The North-Eastern Railway Company.

Mountain Ascents in Westmoreland and Cumberland, by John Barrow, F.R.S. Map and Illustrations. London: Sampson Low, Marston, Searle, and Rivington, 1886. *Mr. Isaac Chorlton.

Specially Surveyed Roads in Scotland, being a Guide for Cyclists, Pedestrians and Sportsmen, together with Index Map of the Routes, and Sectional Touring Map of Scotland, by G. Rowland Brayshay, C.C., C.T.C. London: George Philip and Son, 1890. *Mr. Isaac Chorlton.

Guide to Ullapool and Lochbroom. Illustrated. 1903. *Mr. Isaac Chorlton.

Scotland (Part II). The Northern Highlands, by M. J. B. Baddeley, B.A. Sixth Edition. London: Dulau and Co., 1901. *Mr Isaac Chorlton.

Our Journey to the Hebrides, by Joseph Pennell and Elizabeth Robins Pennell. Illustrated. London: T. Fisher Unwin, 1890. *Mr. Isaac Chorlton.

Ireland (Part I). Northern Counties, including Dublin and neighbourhood, by M. J. B. Baddeley, B.A. Maps and Plans. Fifth Edition. London: Dulau and Co., 1902. *Mr. Isaac Chorlton.

EUROPE.

Guide to Norway, Sweden, and Denmark, including Iceland. Maps, Plans, and Vocabulary. Third Edition. London: Thomas Cook and Son, 1897. *Mr. Isaac Chorlton.

Norge. (Illustrations of Norway.) Kristiania: Mittet and Co., 1912. *Mr. George Thomas, J.P.

Svenska Turistföreningens Arsskrift, 1912. Illustrated. Stockholm, 1912. *Svenska Turistföreningen (The Swedish Touring Club).

Russia's Policy in Finland (from the Russian), by G. Evreinov. (Translator, Victor E. Marsden, M.A., St. Petersburg.) London: Wyman and Sons, 1912. *Mr. N. N. Korevo.

Switzerland and the Adjacent Portions of Italy, Savoy, and the Tyrol. Handbook for Travellers, by K. Baedeker. 26 Maps, 10 Plans, and 9 Panoramas. Ninth Edition. Leipsic: Karl Baedeker, 1881. *Mr. Isaac Chorlton.

Aix-Les-Bains and its Environs, by V. Barbier. Map and Illustrations. Zurich: Orell Füssli and Co. *Mr. Isaac Chorlton.

Resultate der Wissenschaftlichen Erforschung des Balatonsees. Band I, Physische Geographie des Balatonsees und Seiner Umgebung. Teil I, "Geologischer, Petrographischer, Mineralogischer und Mineralchemischer Anhang." "Geophysikalischer Anhang, Sektion IV." Palæontologischer Anhang, Band I, II, III, IV. Teil II, "Hydrographie Anhang." Teil VI, "Chemische Anhang." Maps, Diagrams and Illustrations. Herausgegeben vom Balaton-Ausschusse der Ung. Geographïschen Gesellschaft. Wien, 1911 and 1912. *Société Hongroise de Geographie (Comité du Balaton).

The British Chamber of Commerce of Turkey. Quarterly Trade Journal. Nos. 17 March, 18 June, 19 September, 20 December, 1912. *Mr. George Thomas, J.P.

ASIA.

Palestine Exploration Fund. Quarterly Statements and Annual Report, 1912.

Sixth and Seventh Reports on Plague Investigations in India. Issued by the Advisory Committee, appointed by the Secretary of State for India, the Royal Society, and the Lister Institute. London: The Journal of Hygiene. Plague Supplements I and II, 1912. *The Chairman of the Advisory Committee.

Central Provinces District Gazetteers. Amraoti District, Vol. A. Amendments to B Vols. (Tables) of Bilaspur, Bhandara, Chanda, Jubbulpore, Raipur Districts. *H.M. Secretary of State for India.

District Gazetteers of the United Provinces of Agra and Oudh. Vols. IX, Farrukhabad; XIII, Bareilly; XXXV, Almora. *H.M. Secretary of State for India.

Bengal District Gazetteers. Vols. XXIX, Hooghly; XXX, Jessore. *H.M. Secretary of State for India.

Eastern Bengal and Assam District Gazetteers. Vol. V, Dacca; Vol. X, Dinajpur; XII, Rangpur. *H.M. Secretary of State for India.

Burma Gazetteers. Hill District of Arakan, including Town and Village Census Tables, Vol. B; the Bhamo District, Vol. A; Lower Chindwin District, Upper Burma, Myitkyina District, Vol. A; Sandoway District, Vols. A and B; Tharrawaddy, Vol. B; Mergui District, Vol. A. *H.M. Secretary of State for India.

The Golden Chersonese and the way thither, by Isabella L. Bird (Mrs. Bishop). Map and Illustrations. London: John Murray, 1883. *Mr. George Thomas, J.P.

The Inventor the Numeral Type for China for Blind and Illiterate Persons, by Constance F. Gordon-Cumming. Illustrated. London: Downey and Co., 1899. *Mr. George Thomas, J.P.

With the King. Pages from the Life of Mrs. Cecil Polhill (China Inland Mission), by Her Sister, Annie W. Marston. Illustrations. London: China Inland Mission, 1905. *Mr. Isaac Chorlton.

AFRICA.

Sketches of the African Kingdoms and Peoples. Map and Illustrations. London: Society for Promoting Christian Knowledge. *Mr. George Thomas, J.P.

Från Kap till Alexandria. Reseminnen från Svenska Rhodesia-Kongo-Expeditionen of Eric von Rosen. Med 113 Illustrationer och 3 Kartor. Stockholm: Albert Bonnier, 1912. *The Author.

Sierra Leone Messenger. Nos. 77 January, 78 April, 79 July, 80 October. 1912. *The Rev. Canon F. C. Smith, M.A., F.R.G.S.

"*The following 136 Volumes have been presented by Mr. Wm. Booth Leech.*"

A Geographical Historie of Africa, written in Arabicke and Italian, by John Leo, a More, born in Granada, and brought up in Barbarie. Translated and collected by John Pory, lately of Cambridge. Map. London: Georg. Bishop, 1600. *Mr. W. Booth Leech.

Navigantium atque Itinerantium Bibliotheca; or, a Complete Collection of Voyages and Travels, consisting of about Six Hundred of the most Authentic Writers. By John Harris, D.D., F.R.S. Maps and Illustrations. Four Volumes. Revised Edition. London: T. Woodward and others, 1744 and 1748. *Mr. William B. Leech.

A New General Collection of Voyages and Travels, consisting of the most esteemed Relations, which have been hitherto published in any language, comprehending everything remarkable in its kind, in Europe, Asia, Africa, and America, etc. Maps and Plates. Four Vols. London: Thomas Astley, 1745—1747. *Mr. William B. Leech.

Africa: Being an accurate description of the Regions of Ægypt, Barbary, Lybia, and Billedulgerid, the land of Negroes, Guinee, Æthiopia, and the Abyssines; with all the adjacent Islands, etc. by John Ogilby. Maps and Illustrations. London: Tho. Johnson, 1670. *Mr. William B. Leech.

The Adventures of Sig. Gaudentio di Lucca. Being the substance of his Examination before the Fathers of the Inquisition at Bologna in Italy. Giving an account of an Unknown Country in the midst of the Deserts of Africa, etc. Copied from the original manuscript in St. Mark's Library at Venice; with Critical Notes of the learned Signor Rhedi. Translated from the Italian. Glasgow: James Knox, 1765. *Mr. William B. Leech.

Travels through the Continent of Africa, from the Cape of Good Hope to the Empire of Morocco, between the years 1781 and 1797. From the German of C. F. Damberger. Illustration. London: J. Lee, 1801. *Mr. William B. Leech.

A Tribute for the Negro: Being a Vindication of the Moral, Intellectual and Religious Capabilities of the Coloured portion of Mankind; with particular reference to the African Race. By Wilson Armistead. Illustrations. Manchester: William Irwin, 1848. *Mr. William B. Leech.

Savage Africa: Being the Narrative of a Tour in Equatorial, South-Western and North-Western Africa; with Notes on the Habits of the Gorilla; on the Existence of Unicorns and Tailed Men; on the Slave Trade; on the Origin, Character, and Capabilities of the Negro, and on the future Civilization of Western Africa. By W. Winwood Reade, F.R.G.S. Map and Illustrations. London: Smith, Elder and Co., 1863. *Mr. William B. Leech.

The Heart of Africa. Three Years' Travels and Adventures in the Unexplored Regions of Central Africa from 1868 to 1871, by Dr. Georg Schweinfurth. Translated by Ellen E. Frewer. With an Introduction by Winwood Reade. Maps and Illustrations. Two Vols. London: Sampson Low, Marston, Low and Searle, 1873. *Mr. William B. Leech.

Across Africa, by Verney Lovett Cameron, C.B., D.C.L., Commander Royal Navy. Map and Illustrations. New Edition. London: George Philip and Son, 1885. *Mr. William B. Leech.

My Second Journey through Equatorial Africa, from the Congo to the Zambesi in the years 1886 and 1887, by Hermann von Wissmann. Translated from the German by Minna J. A. Bergmann. Map and Illustrations. London: Chatto and Windus, 1891. *Mr. William B. Leech.

The Geography of Africa—Physical, Political, Commercial, by William Hughes, F.R.G.S., and J. Francon Williams, F.R.G.S. London: George Philip and Son, 1896. *Mr. William B. Leech.

British Central Africa. An attempt to give some account of a portion of the Territories under British Influence North of the Zambesi, by Sir Harry H. Johnston, K.C.B. Maps and Illustrations. London: Methuen and Co., 1897. *Mr. William B. Leech.

West Barbary, or, a Short Narrative of the Revolutions of the Kingdoms of Fez and Morocco. With an account of the present Customs, etc., by Lancelot Addison. Oxford: John Wilmot, 1671. *Mr. William B. Leech.

The Adventures of an English Merchant taken Captive by the Turks of Algiers, and carried about the Inland Countries of Africa, with many Observations both curious and profitable. Edited by A. Roberts (about 1680?). *Mr. William B. Leech.

A Journey to Mequinez, the Residence of the present Emperor of Fez and

Morocco, on the occasion of Commodore Stewart's Embassy thither for the Redemption of the British Captives in the year 1721. By John Windus. Illustrated. London : Jacob Tonson, 1725. *Mr. William B. Leech.

The History of the Revolutions in the Empire of Morocco, upon the death of the late Emperor Muley Ishmael, by Captain Braithwaite. Map. London : J. Darby and T. Browne, 1729. *Mr. William B. Leech.

A Compleat History of the Piratical States of Barbary, viz., Algiers, Tripoli and Morocco. Map and Plan. London : R. Griffiths, 1750. *Mr. William B. Leech.

Barbarian Cruelty; or, an Accurate and Impartial Narrative of the Unparalleled Sufferings and almost incredible Hardships of the British Captives, belonging to the Inspector Privateer, Capt. Rd. Veale. Originally by T. Troughton, now republished by Timothy le Bean. Exeter : T. Brice, 1787. *Mr. William B. Leech.

The Present State of the Empire of Morocco. Its Animals, Products, Climate, Soil, Cities, Ports, Provinces, Coins, Weights, and Measures; with the Language, Religion, Laws, Manners, Customs, and Character of the Moors; the History of the Dynasties since Edris, etc. Translated from the French of M. Chenier. Two Vols. Map. London : G. G. J. and J. Robinson, 1788. *Mr. William B. Leech.

A Tour from Gibraltar to Tangier, Sallee, Mogodore, Santa Cruz, Tarudant; and thence over Mount Atlas to Morocco, by William Lempriere. Third Edition. Map. London : L. J. Higham, 1804. *Mr. William B. Leech.

An Account of the Empire of Morocco and the Districts of Suse and Tafilelt, etc., by James Grey Jackson. Maps and Scales. Second Edition. London : W. Bulmer and Co., 1811. *Mr. William B. Leech.

Journey to Morocco, by Capt. G. Beauclerk. Plates. London : Poole and Edwards, 1828. *Mr. William B. Leech.

Adventures in Morocco and Journeys through the Oases of Draa and Tafilet, by Dr. Gerhard Rohlfs. With an Introduction by Winwood Reade. Map and Portrait. London : Sampson Low and Co., 1874. *Mr. William B. Leech.

Morocco and the Moors : Being an account of Travels, with a General Description of the Country and its People, by Arthur Leared, M.D. (Oxon.), F.R.C.P. Map and Illustrations. London : Sampson Low and Co., 1876. *Mr. William B. Leech.

A Visit to the Court of Morocco, by Arthur Leared, M.D. (Oxon.), F.R.C.P. Map and Illustrations. London : Sampson Low and Co., 1879. *Mr. William B. Leech.

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Recent Polar Voyages. From the search after Franklin to the British Polar Expedition 1875–1876. Map and Illustrations. London : T. Nelson and Sons. *Mr. Wm. H. Ward.

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First Crossing of Greenland, by Fridtjof Nansen. Translated from the Norwegian by Hubert Majendie Gepp, B.A. Two Vols. Maps and Illustrations. London : Longmans, Green and Co., 1890. *Mr. Wm. H. Ward.

Northward over the "Great Ice." A Narrative of Life and Work along the Shores and upon the Interior Ice-cap of Northern Greenland in the years 1886 and 1891—1897. With a description of the Little Tribe of Smith-Sound Eskimos, the most northerly human beings in the world, and an account of the discovery and bringing home of the "Saviksue," or Great Cape York Meteorites, by Robert E. Peary, C.E., U.S.N. Maps, Diagrams and Illustrations. In Two Volumes. London : Methuen and Co., 1898. *Mr. Wm. H. Ward.

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William le Queux. Two Vols. Maps and Illustrations. London: Hutchinson and Co., 1903. *Mr. Wm. H. Ward.

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"The North-West Passage." Being the record of a Voyage of Exploration of the ship "Gjöa," 1903—1907, by Roald Amundsen, with a Supplement by First Lieutenant Hansen, Vice-Commander of the Expedition. Two Vols. Maps and Illustrations. London: Archibald Constable and Co., 1908. *Mr. Wm. H. Ward.

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List of Corresponding Societies, etc. (Exchanges).

BRITISH.

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Birmingham. Natural History and Philosophical Society. Proceedings, Vol. XII, No. 5. Annual Report, 1911. List of Members, 1912.

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Croydon. Natural History and Scientific Society. Proceedings and Transactions, 1911–1912.

Edinburgh. The Royal Scottish Geographical Society. The Scottish Geographical Magazine. 1912, Vol. XXVIII, Nos. 1—12, and Index.

Glasgow. Geological Society. Transactions, Vol. XIV, Part II, 1910–1911.

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Hertford. Hertfordshire Natural History Society and Field Club. Transactions, Vol. XIV, Part 4, 1912.

Hull. Yorkshire Naturalists' Union. (Nothing received.)

Leeds. Geological Association. Transactions. (Nothing received.)

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London. The Colonial Office Journal. Vol. V, Nos. 3, 4; VI, 1, 2.

London. The Royal Colonial Institute Journal. "United Empire." Vol. III, Nos. 1—12. Year Book, 1912.

London. Emigrants' Information Office. Combined Circulars on Canada, Australasia, and South Africa. 1912, Quarterly.

London. Royal Geographical Society. The Geographical Journal. 1912, January to December. Year Book and Record.

London. Imperial Institute. Bulletin, Vol. X, Nos. 1—4.

London. India Office. List of Maps, Plans, etc., of India and other parts of Asia. Appendices. (None received.) Gazetteers. (See List of Books.)

London. Royal Botanic Gardens. Kew. Bulletin. 1912, Nos. 1—10 and Appendices I—IV.

London. Royal Society of Literature. Transactions. Vol. XXXI, Parts I, II, III. Report, 1911, and List of Fellows, 1912.

London. The Near East. 1912, Nos. 35—86.

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Manchester. The British Cotton Growing Association. Publications. Nos. 46, 48, 49, 50. (No. 47 not received.)

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Manchester. Museum. The University Museum Handbooks. No. 73.

Manchester. Manchester University. (Nothing received.)

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Penzance. Royal Geological Society of Cornwall. Transactions, Vol. XIII, Part VIII.

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London. Baptist Missionary Society. The Herald. 1912, January to December.

London. British and Foreign Bible Society. 108th Annual Report, 1911–1912. "More Golden than Gold." A popular illustrated Report, 1911–1912. "The Bible in the World," 1912, January to December. The Manchester and Salford Auxiliary. 101st Annual Report, 1911.

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London. The London Missionary Society. 117th Report for the year ending March 31st, 1912.

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London. The Society for the Propagation of the Gospel in Foreign Parts. Report for the year 1911.

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Firenze (Florence). Rivistà Geografica Italiana e Bollettino della Societá di Studi Geografici e Coloniali. Annata XIX, Fasc. 1—10.

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Griefswald. Geographische Gesellschaft zu Greifswald. Jahresbericht. (Nothing received.)

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Lwowie (Lemberg). Towarzystwo Ludozonaweze Kwartalnik Etnografiezny. "Lud." (Nothing received.)

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Nancy. Société de Géographie de l'Est. Bulletin. 1912, Trim. 1—4.

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Naples. Societá Africana d'Italia. Bollettino. Anno XXXI, Fasc. 1—12.

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Oran. Société de Géographie et d'Archéologie. Bulletin Trimestriel. Tome XXXII, Fascs. 130—133.

Para (Brazil). Museu Goeldi (Museu Paraense) de Historia Natural e Ethnographia. Boletim. (Nothing received.)

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Paris. Société de Topographie. Bulletin. Tome XXXVI, Nos. 1—12.

Paris. Comité de L'Afrique Française et Comité du Maroc. Bulletin. 1912. Nos. 1—12. Renseignements Coloniaux. 1912, Nos. 1—12.

Paris. Service Géographique et des Missions du Ministère des Colonies. Revue Coloniale. New Series. (Nothing received.)

Philadelphia. American Philosophical Society. Proceedings. Vol. LI, Nos. 203—207. General Index, Vols. 1—50; 1838—1911. List of Members, etc.

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Rolla, Mo. Missouri Bureau of Geology and Mines. Publications. Vol. X. Iron Ores of Missouri. XI. Coal Deposits of Missouri.

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Roma. Direzione Generale della Statistica e del Lavoro. Annuario Statistico Italiano. Seconda Serie. Vol. I, 1911.

Roma. Commissariato dell' Emigrazione. Bollettino. 1912, Nos. 1—12.

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Rome. International Institute of Agriculture. Bulletin of the Bureau of Agricultural Intelligence and of Plant Diseases. 1912, No. 9.

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St. Nazaire. Société de Géographie Commerciale. Bulletin. (Nothing received.)

St. Petersburg. Imperial Russian Geographical Society. Journal. Vol. XLVIII, Nos. 1—5.

San Salvador. Direccion General de Estadistica y Observatorio Nacional. Anuario de 1911. Monografias Departamentales. IX, Departamento de Cuscatlan.

Santiago de Chile. Deutschen Wissenschaftlichen. Vereins. Verhandlungen. Band VI, Heft 2.

Shanghai. Imperial Maritime Customs. China. Gazette. Statistical Series. Nos. 3 and 4. Returns of Trade and Trade Reports, 1911, Part I, II, Vols. 1—5, III, Vols. 1, 2.

Shanghai. Ministry of Communications. Directorate General of Posts. II. Public Series : No. 2. Report on the Working of the Chinese Post Office for the Third Year of Hsüan T'Ung, of the Former Ch'Ing Dynasty (1911).

Stettin. Gesellschaft für Völker-u-Erdkunde. (Nothing received.)

Stockholm. Svenska Sällskapet för Antropologie och Geografi. Ymer. 1912, Heft 1—4.

Strassburg. Gesellschaft für Erdkunde und Kolonialwesen. Mitteilungen. Zweites Heft, 1911; Drittes Heft, 1912.

Stuttgart. Württembergische Vereins für Handelsgeographie. (Nothing received.)

Tokyo. Geographical Society. Journal of Geography. 1912, Nos. 277—288.

Toulouse. Société de Géographie. Bulletin. 1912, Nos. 1—4.

Tours. Société de Géographie. Revue. 1912, Nos. 1—4.

Upsala. University of Upsala. Inbjudningsskrift till Ahörande af de Offentliga Föreläsningar. Johann Beckmans Schwedische Reise. 1765—1766. Hefts 1 and 2. En Sydsvensk Israndslinie och des Geografiska Betydelse. Akademisk Afhandling. Uber das Erscheinen der Seebrise an der Schwedischen Ostküste. Inaugural Dissertation. Geological Institution. Bulletin. (None received.)

Urbana. Illinois State Geological Survey. Bulletins. Nos. 17—19.

Vienna. K. K. Geographische Geselschaft. Mitteilungen. Band 55, Nos. 1—12. Abhandlungen. Band X, Nos. 1, 2.

Vienna. Verein der Geographen an der K. K. Universität in Wien. (Nothing received.)

Vienna. K. K. Naturhistorische Hofmuseum. Annalen. Band XXVI, Nos. 1—4.

Washington. D.C. National Geographic Society. Magazine. 1912, Vol. XXIII, January to December.

Washington. D.C. United States Department of Commerce and Labor. Coast and Geodetic Survey. Report, 1910-1911. "Terrestrial Magnetism" Results of Magnetic Observations made between July 1, 1910, and June 30, 1911; Appendix No. 3. Results of Observations made in 1909 and 1910 at the Magnetic Observatories at Cheltenham, Maryland; Honolulu, Hawaii; Vieques, Porto Rico; Sitka, Alaska; near Tuscon, Arizona. "Geodesy." Special Publications, Nos. 10 and 12. The Effect of Topography and Isostatic Compensation upon the Intensity of Gravity. No. 11. The Texas-California Arc of Primary Triangulation.

Washington. D.C. United States Geological Survey. Annual Report for the year ended June 30th, 1912.

Washington. D.C. United States Geological Survey. Monograph. LI. "Cambrian Brachiopoda." Part I, Text; Part II, Plates.

Washington. D.C. United States Geological Survey. Bulletins. Nos. 471, 501—503, 505—517, 519—521, 523, 524.

Washington. D.C. United States Geological Survey. Mineral Resources for the year 1911; Parts I, Metals; II, Non-Metals.

Washington. D.C. United States Geological Survey. Professional Papers. Nos. 71, 77. (See also List of Maps.)

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Washington. D.C. Smithsonian Institution. Reprints from the Report for 1911. Publications, 2105 and 2107.

Washington. D.C. United States National Museum. Report for the year ending June 30, 1911.

Washington. D.C. United States Department of Agriculture. Weather Bureau. Report of the Chief for 1911–1912.

Washington. D.C. U.S. Department of Agriculture. Bureau of Statistics. Reprints from the Year Book for 1911. Nos. 558, 587, 588. Circulars. Nos. 32, Cotton Crop of the United States, 1790—1911; 34, Rice Crop of the United States, 1712—1911; 35, Hop Crop of the United States, 1790—1911. Bulletins. No. 94, Supply of Farm Labor; 95, Imports of Farm and Forest Products, 1909—1911; 96, Exports of Farm and Forest Products, 1909—1911; 99, Wages of Farm Labor; 100, Railroads and Farming.

Washington. D.C. United States War Department. Annual Reports. 1911. Vols. 1, 2, 3, 4.

Washington. D.C. United States Bureau of Education. Report of the Commissioner of Education. (Nothing received.)

Washington. D.C. Library of Congress. Report for the Fiscal Year ending June 30th, 1912. (See List of Books, etc.)

Washington. D.C. Pan American Union. International Union of American Republics. Bulletin. 1912, January to December.

Washington. D.C. Carnegie Institution. Department of Terrestrial Magnetism. Annual Report, 1912.

Washington. Conn. Association of American Geographers. Annals. Vol. II, 1912.

Zurich. Geographisch-Ethnographischen Gesellschaft in Zurich. Jahresbericht. 1911–1912.

List of Members,

DECEMBER 31st, 1912.

Note.—H signifies Honorary, C—Corresponding, L—Life, A—Associate, * Affiliated Societies. All others are Ordinary Members.

Abbott, James H.
Adam, Sir Frank Forbes, C.I.E.
LAinsworth, John, C.M.G., F.R.G.S. (Kisumu)
AAlexander, Miss M. N.
Alexander, W. T., J.P.
Allen, John W.
HArgyll, His Grace the Duke of, K.T.
Armitage, G. F., J.P.
Armstrong, F.
Arning, A. W.
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I. OBJECT AND WORK.

The object of the Manchester Geographical Society is to promote the study of all branches of Geographical Science, especially in its relations to commerce and civilisation.

The work of the Society shall be :—

1. To further in every way the pursuit of the science; as, by the study of official and scientific documents, by communications with learned, industrial and commercial societies, by correspondence with consuls, men of science, explorers, missionaries, and travellers, and by the encouragement of the teaching of geography in schools and colleges.

2. To hold meetings at which papers shall be read, or lectures delivered by members or others.

3. To examine the possibility of opening new markets to commerce and to collect information as to the number, character, needs, natural products and resources of such populations as have not yet been brought into relation with British commerce and industry.

4. To promote and encourage, in such way as may be found expedient, either alone or in conjunction with other Societies, the exploration of the less known regions of the earth.

5. To inquire into all questions relating to British and Foreign colonisation and emigration.

6. To publish a Journal of the proceedings of the Society, with a summary of geographical information.

7. To form a collection of maps, charts, geographical works of reference, and specimens of raw materials and commercial products.

8. The Society shall not enter into any financial transactions beyond those necessarily attached to its declared object, and shall not make any dividend, gift, division, or bonus in money unto or between any of its members.

II. ORGANISATION.

9. The Society shall consist of ordinary, associate, corresponding, and honorary members.

10. A Council shall be chosen annually from the ordinary members to conduct the affairs of the Society. It shall consist of a President, four or more Vice-Presidents, a Treasurer, two or more Honorary Secretaries (including a Secretary for Foreign Correspondence), and twenty-one Councillors.

11. There shall be three Trustees elected by the Society, who shall hold office until death, disability, insolvency, or resignation. They shall be members of the Council by virtue of their office.

12. Any vacancy occurring in the Council during the current year may be filled up by the Council.

III. ELECTION OF MEMBERS.

13. Every candidate for admission into the Society as an ordinary or an associate member must be proposed by a member. The proposal shall be read out at the next Ordinary Meeting of the members, and any objection shall be forwarded in writing to the Secretary within seven days.

14. The election of members is entrusted to the Council. The names of those elected shall be announced from the chair at the next Ordinary Meeting after the election.

15. The Secretary shall within three days forward to every newly-elected member notice of his election, a copy of the Rules of the Society, and a card

announcing the days on which the Ordinary Meetings will be held during the session. But the election of an ordinary or associate member shall not be complete, nor shall he be permitted to enjoy the privileges of a member, until he shall have paid his first year's subscription. Unless such payment be made within three calendar months from the date of election the election shall be void.

16. The Council shall have power to elect honorary and corresponding members.

17. Women shall be eligible as members and officers of the Society.

IV. PAYMENTS.

18. An ordinary member shall pay an annual subscription of £1. 1s., or he may compound by one payment of £10. 10s. An associate member shall pay an annual subscription of 10s. 6d. The Society's year shall begin on the first day of January.

19. Members shall not be entitled to vote or to enjoy any other privilege of the Society so long as their payment shall continue in arrear, but associate members shall not vote nor shall they take any part in the government of the Society.

20. The first annual payment of a member elected in November or December shall cover his subscription to the 31st of December in the year following.

21. On the first day of January in each year there shall be put up in the rooms of the Society a complete list of the members with the amount of their subscription due, and as the amounts are paid the fact shall be marked on the list.

22. Notice shall be sent to every member whose subscription shall not have been paid by the first of February, and if the arrears are not discharged by the first of July the Council may remove the member from the list of members. Any member, whose subscription is in arrear for two years shall not be entitled to receive the Journal of the Society.

V. MEETINGS.

23. The meetings of the Society shall be of three kinds—Ordinary, Annual, and Special.

24. In all meetings a majority of those present shall decide all questions, the President or Chairman having a casting vote in addition to his own.

Ordinary Meetings.

25. The Ordinary Meetings of the Society shall be held once a month, from the month of October to the month of May, or oftener, if judged expedient by the Council.

26. All members whose subscriptions are not in arrear shall have a right to be present. All ordinary members shall have the privilege of introducing one visitor.

27. The order of the proceedings shall be as follows:—

(a) The minutes of the last meeting to be read and if correctly recorded they shall be signed by the Chairman.

(b) Presents, whether of money, books, maps, charts, instruments or specimens, made to the Society to be announced.

(c) The election of new members to be declared and the names of candidates to be read.

(d) Papers and communications to be read and discussed.

28. At these meetings nothing relating to the rules or management shall be brought forward, but the minute book of the Council shall be on the table at

each meeting for the inspection of any member, and extracts therefrom may, with the consent of the chairman, be read to the meeting on the requisition of any member.

29. On occasions of exceptional interest the Council may make provision for a larger admission of visitors.

Annual Meetings.

30. The Annual Meeting of the members shall be held at such time and place as the Council may determine.

31. Fourteen days' Notice of such meeting shall be sent to every member within the United Kingdom who has given his address to the Secretary, and notice of the meeting shall be advertised in such newspapers as the Council may direct.

32. The object of this meeting shall be to receive the Annual Report of the Council and the Treasurer's Balance Sheet, to hear the President's address, to elect the Council and officers for the ensuing year, and to transact any other business.

33. Any two ordinary members may nominate candidates for the Council or for office not later than one week prior to the day of election, and the names of candidates so nominated shall be at once put up in the rooms of the Society. The election of the Council and officers shall be by ballot.

Special General Meetings.

34. The Council may call a Special General Meeting of the Society whenever they shall consider it necessary, and they shall do so if required by 20 ordinary members.

35. A week's notice of the time and object of every Special Meeting shall be sent to all members. No other business shall be entertained than that of which notice has been thus given.

36. Twenty ordinary members shall form a quorum.

VI. COUNCIL AND OFFICERS.

The Council.

37. The government of the Society shall be entrusted to the Council, subject to the rules of the Society.

38. The Council shall annually elect a Chairman and Vice-Chairman.

39. The President or the Chairman, or any three members of the Council, may at any time call a meeting thereof, to which every member of the Council shall be summoned.

40. Seven shall form a quorum.

41. In order to secure the most efficient study and treatment of the various subjects which constitute the chief work of the Society, the Council may appoint Committees for special purposes. These Committees, with the approbation of the Council, may associate with themselves any persons—whether members of the Society or not—from whom they may desire to obtain special assistance or information. The Committees shall report to the Council the results of their proceedings.

42. The President, Chairman, Vice-Chairman of the Council, and the Honorary Secretaries, shall, by virtue of their offices, be members of all Committees appointed by the Council.

President and Vice-Presidents.

43. The President, is, by virtue of his office, the chairman of all the meetings of the Society. In the absence of the President, one of the Vice-Presidents may preside.

Chairman of the Council.

44. It is the duty of the Chairman of the Council to see that the rules are properly observed, to call for reports and accounts from Committees and Officers, and to summon, when necessary, special meetings of the Council and of Committees.

Treasurer.

45. The Treasurer has the charge of all accounts; he shall pay all accounts due by the Society after they have been examined and approved by the Council.

46. He shall see that all moneys due to the Society are collected, and shall have power, with the approval of the Council, to appoint a collector. All moneys received shall be immediately paid to the bankers of the Society.

47. The bank passbook and the book of accounts shall be laid upon the table at every ordinary meeting of the Council.

48. The accounts shall be audited annually by two members, who shall be elected at an ordinary meeting at least one month before the Annual Meeting.

Secretaries.

49. The duty of the Honorary Secretaries shall be :—

(a) To conduct the correspondence of the Society and of the Council.

(b) To attend the meetings of the members and of the Council, and minute their proceedings.

(c) At the ordinary meetings, to announce gifts presented to the Society since their last meeting; to read the names of all new members and of candidates for admission, and the papers communicated to the Society, which have been directed by the Council to be read.

(d) To have immediate superintendence of all persons employed, to make arrangements for the meetings of the Society, and to take charge of all maps, books, furniture and other effects.

50. It shall be the more especial duty of one of the Honorary Secretaries to conduct, as may be directed by the Council, correspondence with Foreign Societies, and with persons resident abroad.

51. In addition to the Honorary Secretaries, there shall be a paid Secretary appointed by the Council, whose duties shall be to assist the Honorary Secretaries, to issue the notices of the Council and of the Society, and to act under the instructions of the Council.

The foregoing Rules, as now amended, were approved and adopted at a meeting of the members of the Society, of which due notice had been given to the members, held in the Town Hall, Manchester, Wednesday, October 3rd. 1894.

(Signed) GEORGE, President.
S. ALFRED STEINTHAL, Chairman.
F. ZIMMERN, Honorary Secretary.
JAS. D. WILDE, M.A., Honorary Secretary.
ELI SOWERBUTTS, Secretary.

[Copy.]

It is hereby certified that this Society is entitled to the benefit of the Act 6 and 7 Vict., Cap. 36, intituled "An Act to exempt from County, Borough, Parochial, and other Local Rates, Lands and Buildings, occupied by Scientific or Literary Societies."

Seal of Registry of
Friendly Societies.

This 15th day of January, 1895.

E. W. B.

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Manchester Geographical
Society, Manchester, Eng.
Journal

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